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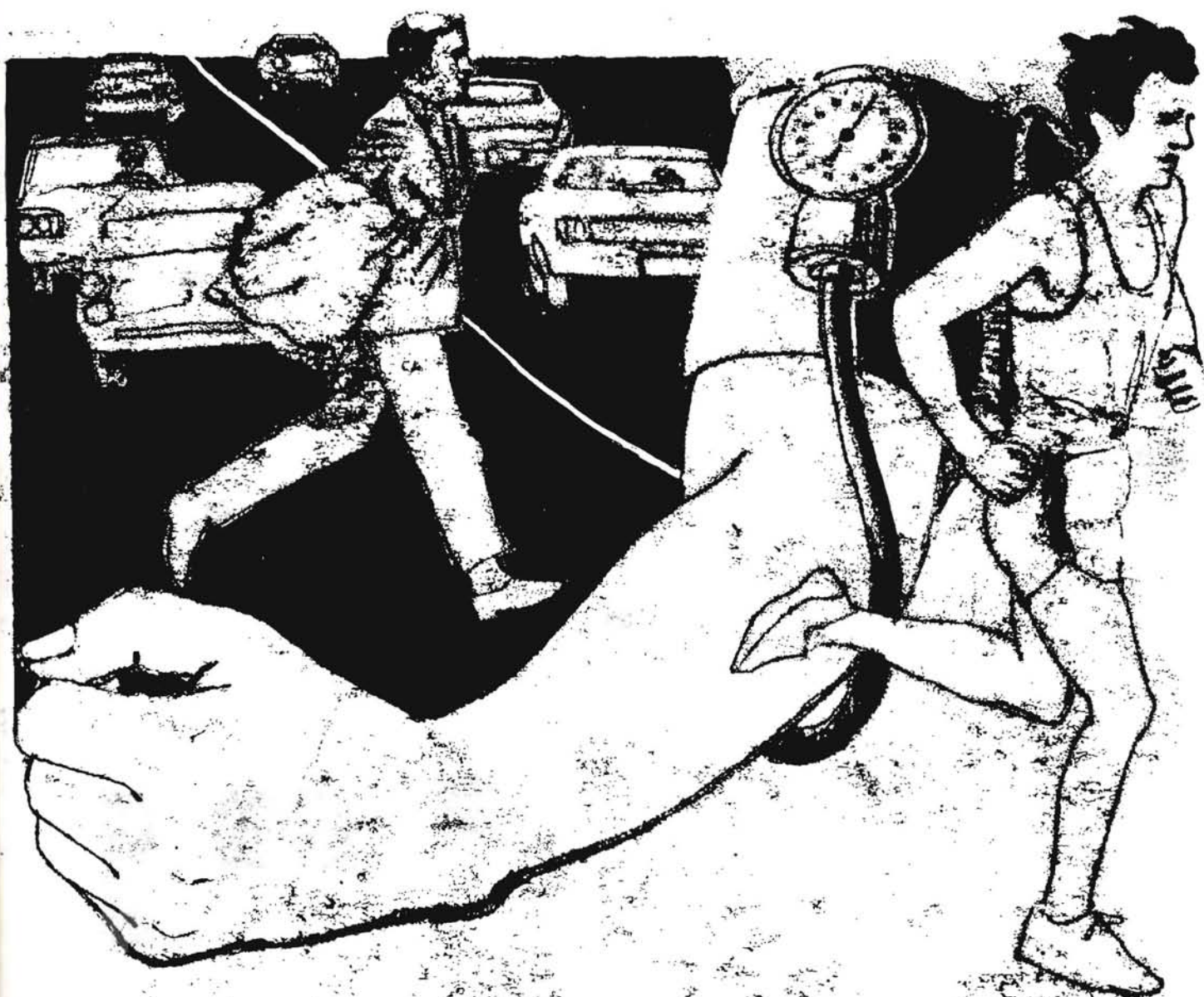
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Outlook

# Washington University School of Medicine

March 1978



*On the Cover:*

Stress is a part of everyday life. The medical aspects, symptoms, complications and treatment of stress are discussed in the story on the following page.

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## Contents

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Stress: Coping with the inevitable .....	1
Carl Harford, M.D.: Caring, dedication, hard work .....	10
An ancient art assists medical research .....	14
Profile of the freshman class .....	16
Students need help meeting soaring costs of medical education .....	24
Etcetera .....	27

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# Stress: Coping with the inevitable

by Glenda King Rosenthal

**Some 2000 years ago the apostle Matthew said, "And which of you by worrying can add one unit . . . to the span of your life?" For 20th century man he might have added, "but if you stop worrying, you may be able to do just that."**

**—Emergency Medicine  
September 1977**

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Which of these life events produce stress: marriage, divorce, a job change, a move or Christmas? The answer is that all of these events produce stress, with divorce generating the most, Christmas the least.

Several years ago at the University of Washington in Seattle, two psychiatrists rank-ordered 43 life events and assigned them scores between 1 and 100, depending on the amount of stress the event generates. Death of a spouse was found to be the most traumatic event of all, rating 100 stress points. Divorce rated 73, marriage 50, job change 36, change in residence 20 and Christmas 12.

These ratings, known as the Holmes-Rahe scale, apply to people of all races and ages. It has been tested with thousands of people in the United States, France, the Netherlands, Belgium and Japan with the results always the same. Illness will occur when there are too many stressful life changes over a short period of time.

Further studies indicate that an individual with 200 to 300 accumulated stress points stands a 50 per cent chance of developing physical health problems. If the score is more than 300 points, the person has a four in five chance of becoming ill.

Intense stress all at one time or persistent frustration and worry, which is allowed to build up over a period of time, can eventually threaten an individual's health. Ultimately, a person under constant stress may experience a variety of symptoms. This prolonged tension can play an important role in exacerbating symptoms caused by cardiac disorders, particularly hypertension, digestive tract ailments, such as peptic ulcer and colitis, headaches and joint and muscular pains.

A certain amount of stress is unavoidable in day to day living; emotional and physical stress is an integral part of our daily experiences. An individual's ability to adapt to these experiences can determine the way in which the body will react to this stress. If a person is to handle stress well, it is important to him to be open about his emotions

and discuss problems with family, friends, and in many cases, with his physician.

The physician who deals with stress related illnesses must develop a unique relationship with his patients, more often than not serving as a counselor for the patient's emotional as well as physical problems.

David H. Alpers, M.D., professor of medicine and head of the Division of Gastroenterology, sees many patients with stress related problems. "I can't imagine a practicing gastroenterologist who shouldn't have an interest in dealing with emotional problems," he says. "From a practical point of view, it makes more sense for us to deal with it than to send the patient to a psychiatrist. We sometimes follow a patient in conjunction with a psychiatrist, but he may not have a good knowledge of the physiological abnormalities which may be going on."

Alpers points out that if a patient is sent to a psychiatrist, he might interpret this to mean that his physician feels his symptoms are imagined. "The term psychosomatic has been dropped by the American Psychiatric Association," he says, "because it carries with it the implication that the patient's symptoms are invented. This is a bad philosophy for the physician to have, not at all conducive to good patient rapport."

Alpers feels it is important to take a good psychiatric history when dealing with a patient afflicted with a gastrointestinal disorder. But the patient should not be made to feel his symptoms are not genuine.

"It's necessary to give the patient a rational explanation for the occurrence of his symptoms," he says. "We can tell the patient that stress and his personal problems are an important factor in the production of his symptoms, but they haven't necessarily caused them. This lessens the feeling that the patient has caused his own disease. The patient can then come to my office, feel he has a right to be there, and discuss his problems more openly. He knows he has a legitimate illness and is more willing to accept the fact that emotional factors may have contributed to it," Alpers says.



Alpers says that in the majority of cases there's a specific physiological abnormality causing the patient's gastrointestinal distress. Those patients with irritable bowel syndrome usually have abnormal intestinal contractions. Unfortunately, however, such persons do not always benefit from medication.

"The physician can't assume that his only role when dealing with a patient with a stress related illness is to make a diagnosis and give medicines," Alpers says. "In many cases, medication for symptoms caused by physiological abnormalities (e.g. irritable colon) is not the thing to do.

"Patients with gastrointestinal disorders are not always easy patients to deal with. In many instances, we're dealing with patients who have had their symptoms for a long time. They often have underlying emotional disease and live in a complicated milieu of family and personal problems."

Alpers emphasizes that the physician can't really hope to change all of this. More can be done for the patient with a milder gastrointestinal disease.

"For the patient with a more severe illness, all we can really do is improve the symptoms," he says. "It is important for that patient to understand the situation, and sometimes just constant reassurance from the physician can benefit him. Of course sometimes we can't help a patient at all, usually because of their emotional situation or the extent of their illness."

Alpers says many times a patient wants specific advice from his physician, such as whether or not he should take a vacation or change jobs. "I certainly can and do give my patients such advice," he says, "but I have learned that most people are in their life situation because they get something out of it. I have treated many men who work constantly under stressful situations because they are avoiding marital problems.

"Many people take laxatives because they feel it is necessary to move their bowels every day. It does no good to tell them this isn't necessary. I can attempt to make minor adjustments in a patient's life, but I am obviously limited by the patient's own beliefs."

An ulcer patient is asked to stop smoking and drinking, but Alpers emphasizes that the physician should not do this in a punitive way. "If we eventually realize the patient is not going to change," he says, "then we tell him we're going to have to treat him more vigorously with medication. We have to pick

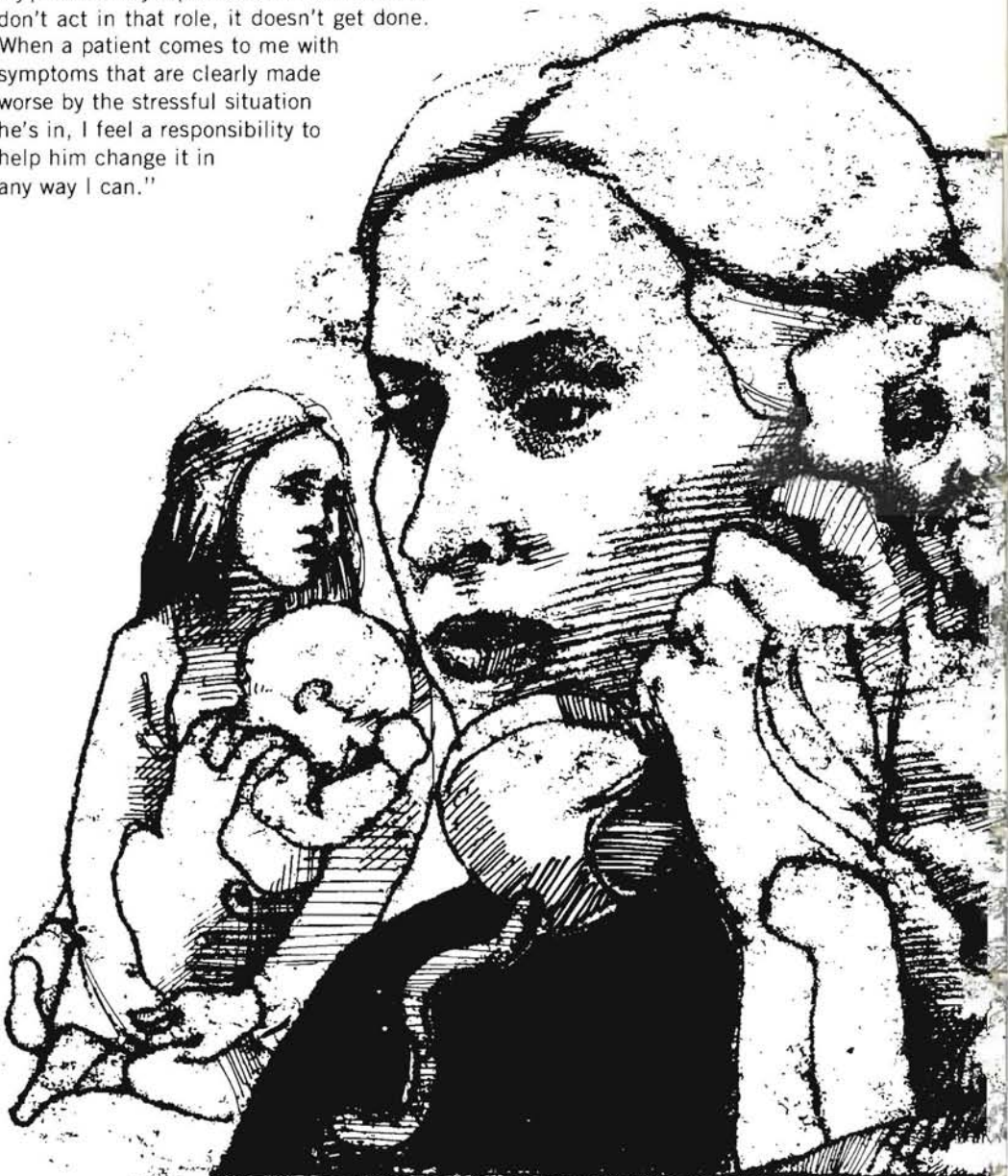
the limitations to impose on a patient which we feel will be the most beneficial to his health."

Alpers does not feel a physician should be judgemental over his patient's choice of a lifestyle. "In the first place," he says, "changing a person's lifestyle is a very difficult thing to do, and we have to be awfully sure it's going to make a difference in his health. If a patient tells me his ulcer hurts everytime he smokes, then that's an obvious thing I can ask him to change. It would be much more difficult for me to tell him to divorce his wife or change his profession.

"However, I do act as counselor to many of my patients. My experience has been that if I don't act in that role, it doesn't get done. When a patient comes to me with symptoms that are clearly made worse by the stressful situation he's in, I feel a responsibility to help him change it in any way I can."

Alpers says most of the gastrointestinal patients he sees are between the ages of 25 and 45. Their emotional make-up was developed in childhood, but the emotional stress which contributes to their illness doesn't show up until later. He also sees more women than men with emotional problems.

"Women tend to translate their emotional problems to the GI tract," he says, "while a man is more likely to develop other symptoms. Frequently I will have a GI patient who also suffers from migraine headaches. Of course if the patient's headaches are especially severe, he will be referred to a different physician."





Oftentimes Alpers sees a patient with gastrointestinal problems who is going through a particularly distressing time in his life. There are certain stressful situations which will contribute to gastrointestinal problems, but once the situation is back to normal, the symptoms will improve.

"For example," he says, "it is not uncommon for a student to suffer from diarrhea before an important exam. Increased intestinal contractions are a natural response to stressful conditions. This is one way the intestinal tract responds to stress, and once the stressful situation is over, the symptoms go away."

"The student under sporadic duress and the person who suffers from gastrointestinal problems are both examples of the mind sending signals to the intestinal tract which can markedly affect its function."

For this reason, Alpers says he always tries to diagnose a patient's emotional disease and its subsequent role in the function of the intestinal tract.

"Nerves and emotions clearly effect the function of the digestive system," he says. "However, it's quite another thing to say stress will actually cause a gastrointestinal illness. This is a theory for which there is no concrete evidence at the present time. On the other hand, stress or any kind of emotional disturbance can alter the symptoms of an established disease. Of course we're certainly not eliminating the possibility that emotional disease can actually cause certain GI disturbances."

Alpers says ulcerative colitis is a good example of a disease which can get markedly worse under altered life situations, but that doesn't necessarily mean the colitis is caused by those situations. He also says there are certain gastrointestinal diseases in which the patient must be careful not to undertake too much activity.

"Inflammatory bowel disease is a good example of this," he says. "If the person overexerts himself, he will feel much worse, simply from fatigue."

According to Alpers, peptic ulcer disease is more common in western civilization in which the pace of life is faster and a high premium is placed on success. However, these variables are not the only ones which separate our culture from others. One out of ten Americans at some time will be affected by peptic disease.

"I think it is reasonable to say that stress can alter the rate at which we secrete acid," Alpers says. "And it is reasonable to say that in our industrialized society where there is more stress, however one wants to define it, there is more gastrointestinal disease than there is in other societies. These factors may or may not be related to each other."

"Nerves and emotions will absolutely affect the function of the digestive system; they can contribute to symptoms on any level of gastrointestinal disease. For this reason I spend more time talking with my patients and listening to their problems than I do in ordering tests for them," Alpers says.

Sven G. Eliasson, M.D., Ph.D., professor of neurology, also spends a great deal of time talking with his patients who come to him because of their chronic headaches, one of the more common manifestations of accumulated stress. Many suffering from chronic headaches are reluctant to come to a physician with what they consider to be a trivial problem.

"Most people will call their stress headache something else, usually a migraine, because they feel it is more socially acceptable," Eliasson says. "To many people a stress headache implies they have some sort of emotional problem. This is particularly true of men who tend to view giving into a headache as some sort of weakness. Men tend to carry on for several years before they will seek help. On the other hand, women usually will come in sooner after the onset of headaches. They are somewhat less reluctant to discuss the possibility that life's circumstances are getting them down."

According to Eliasson, people want the possibility of some other ailment ruled out first. He says some patients would actually prefer discovering a physical cause for their pain rather than admitting it is from stress. After the possibility of a physical cause is eliminated, Eliasson begins his role as counselor.

"As soon as I start asking the patient questions, it becomes apparent that something in his life is bothering him," Eliasson says. "As I ask questions and listen, the patient also listens. After two hours or so for several weeks, the patient finally begins to hear and understand what he is saying."

Eliasson says he spends a great deal of time listening to what the person is doing, what his life is like, and what type of relationship he has with the important people in his life. He will usually discover the person has many small irritations in his life which have built up over time or a more serious problem, such as intense marital stress.

"Most of the people I see are between the ages of 25 and 45, the prime years for stress headaches," Eliasson says. "This is the time in a person's life when he becomes very success oriented. If a person is going to achieve success, he'll do it during these years."

"Consequently, people in this age group usually attempt to undertake too many things, and they're extremely reluctant to give up any of their activities. These people work and are an essential part of the household. The man may hold down two jobs to make ends meet; the woman may have a job in addition to managing a home and caring for children. Sometimes I get a headache just from hearing what these people are trying to accomplish!"

Eliasson gives as an example of this a young career woman who also is attempting to paint and redecorate her new home, be active in several organizations, and manage her three young children.





"When things don't stay on schedule," he says, "she gets a headache which further slows things down. This only aggravates her unhappiness and increases the headaches. When she finally came to me, she said she couldn't understand why she was getting them. All she wanted was some medicine which would allow her to go back and do all of her activities even better than before."

Of course some people can take on many different responsibilities and handle them all well and effectively. Others are completely undone if they are given one more responsibility. According to Eliasson, the extroverted person handles stress producing situations much better because he does not tend to harbor hostilities. This type of person understands what is happening to him and usually has reasonable control over himself and his life. This type also is less inclined to demand perfection from everything in his life. The perfectionist is the one who suffers the most from stress headaches.

"One of my patients has been teaching Sunday school for 20 years," Eliasson says. "When she can't get the lesson perfectly prepared by Sunday, she develops severe tension headaches. She finally had to give up this particular activity when it became too much for her. This woman had been raised in an atmosphere in which one was taught to take on many responsibilities and do them all perfectly, without complaining."

This particular woman's case is a good example of how parental influence affects us in later years. Eliasson says it is not uncommon to have a patient who is still trying to live up to his parent's expectations of him, and developing stress headaches when he feels he's not accomplishing it.

"How we raise our children and handle their triumphs and inadequacies becomes very important in their adult years," Eliasson says. "We need to be very aware of the kinds of demands we put on them, or more importantly, the kinds of demands they feel we put on them."

Eliasson says he encounters many patients who undertake a tremendous amount and expect success in everything they do. Obviously this strains their capabilities and puts them under a great deal of stress.

"These people wouldn't expect someone else to do that much," he says, "but they expect it from themselves. Eventually these people will come to realize it is not humanly possible to do all of those things, and they will begin to consider easing their work load."

At this point, according to Eliasson, the headaches may ease when all or part of the stressful situation is eliminated. Of course, it is important for the patient to have eliminated the right stressful situation.

"The people I see oftentimes let things build up until they cannot pinpoint what one thing is contributing to their headache," he says. "Many people allow themselves to become terribly angry about the situations they are in, and yet the people they are angry with may not even know it."

Eliasson says he often sees patients who will not admit what is really producing the stressful situation and consequently the tension headaches. "This is particularly true if sexual problems or marital difficulties are the cause," he says. "I need to work on establishing a good rapport with the patient so he will feel free to discuss this type of problem with me."

"Of course it is hard for a husband to go home and tell his wife his doctor thinks she's the cause of his headaches. However, I have found it does help the patient to simply talk over the problem with the physician. It's easier to deal with something once it has been said and recognized for what it is," Eliasson says.

If the cause of the stress related headache cannot be eliminated, Eliasson says the patient can at least come to grips with it and learn to live within the situation. Like Alpers, Eliasson feels the physician should certainly offer advice but without being judgemental about the patient's choice of a lifestyle.

"Some people are in bad marriages they don't want to dissolve for one reason or another," he says. "I obviously can't tell that person to get a divorce; what I can do is help them adapt to and accept the situation. Nor could I tell a married working woman to quit her job and take income away from that family. With certain types of patients, I can tell them to eliminate the less important activities in their life, such as club work, and see if the headache eases."

In addition to counseling, Eliasson says he usually treats stress headaches with some form of medication.

"The drugs we use have a beneficial effect in the beginning when the patient has finally decided he needs help for his headache," he says. "The patient wants fast relief but is not yet geared to the idea that it may take six or more weeks of discussion to help him."

The medication regimen is usually extended for two weeks to several months, depending on how frequently the patient is

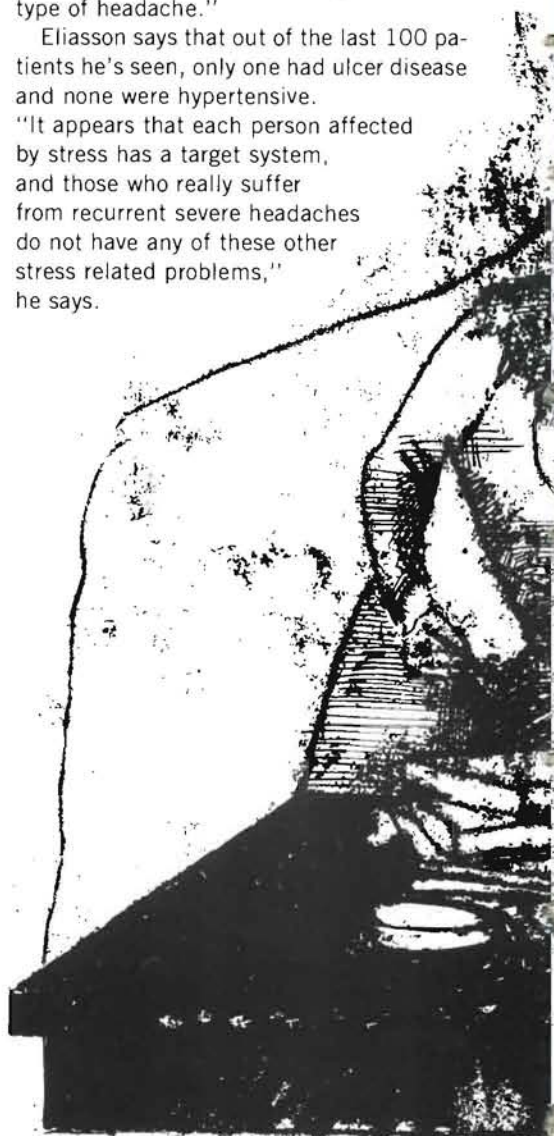
seen. "Eventually the medication can be decreased," Eliasson says, "and the patient will do quite well without it. In the meantime, we attempt to discover the source of the stress. Ideally by the time the patient is off of the medication, he will have begun to work on the problem."

Eliasson occasionally sees a patient with an intense stress headache which goes away as soon as the stress producing situation is eased. As is the case with gastrointestinal diseases, the intermittent stress headache is not uncommon during a life crisis such as a divorce or family death.


"This is an acute stress headache which the person usually recognizes as such," he says. "These headaches are pounding in character and different from the dull, persistent type. The person who is under intermittent stress is more likely to get the latter type of headache."

Eliasson says that out of the last 100 patients he's seen, only one had ulcer disease and none were hypertensive.

"It appears that each person affected by stress has a target system, and those who really suffer from recurrent severe headaches do not have any of these other stress related problems," he says.







The number of people Eliasson treats for stress headaches has increased dramatically over his 25 years in practice.

"I'm sure our more hectic way of life has a great deal to do with this increase," he says. "I do know I treat more women for stress now that they are joining the work force in greater numbers. I do think women have a more exciting and interesting lifestyle than they did in the past, and most seem to be willing to take the stressful situations along with the benefits. I also think many women would have more headaches if they stayed home without really wanting to be there. The quality of life is important here, and enjoying what one does is a very important factor."

"It seems to me that certain types of people tend to go overboard and attempt too much, even though many people tend to thrive on intense situations. I know many successful people who get a headache in between challenges; when a new one comes along, they're fine," he says.

Eliasson feels a certain amount of stress is good for all of us, but the variety of how much each individual can take will vary.

"I think it is healthy to be active if that is what one thrives on," he says. "People who have been active all their lives don't come up with headaches when they retire; they come up with other activities. On the other hand, I have patients who no longer need treatment after they retire. Their headache disappears when they leave their stressful job."

Most of Eliasson's patients are referred by internists or former patients. "I find it very satisfying to help a person begin to function again after he has been incapacitated for so long. I view it as an advantage to be an academic physician because I can take the time to really talk with each one of my patients. For the patient suffering from a stress headache, or any other stress related illness, this is really the best form of treatment."

Like Alpers and Eliasson, H. Mitchell Perry, Jr., M.D., professor of medicine and head of the Hypertension Division, agrees that good patient rapport is very important when dealing with the patient under stress.

According to Perry, hypertension is an extremely common stress-related illness which affects about 40 million people in the United States alone. The importance of treating hypertension is now generally recognized by physicians, but certain problems still remain. He cites two pressing problems. The first is getting the patient to have his pressure checked; the second is getting him to stay with whatever therapy he needs, usually over his entire lifetime.

Of the 40 million people in the United States afflicted with hypertension, according to Perry, only about a third fit into the group which we know benefit from drug treatment. Treatment in this group is known to decrease complications of hypertension, specifically strokes and heart attacks. A second third have mild hypertension. This is real hypertension which increases the risk of stroke and heart attacks, but it is not known whether drug treatment lowers the risk of complications in this group. (Perry has recently served as chairman of a joint NHLBI-VA study to consider the feasibility of a national study to determine the benefits



of treatment in this group.) The final third have hypertension that is only intermittently present.

Perry says, "This middle group, the mildly hypertensive, is the one about which we need more information. They are usually relatively young, asymptomatic people, and yet they are at high risk of developing heart attacks during their productive years."

According to Perry there is a dilemma between treating the mildly hypertensive patient for a long period of time and possibly affecting his quality of life. "Even if we knew we could prevent three strokes by treating 100 people for 20 years, we would have to look at the relative merit of making everyone in the group slightly symptomatic for twenty years in order to prevent a catastrophe in three of them at the end of that time," Perry says.

"At the present time we do not have the kind of data which will tell us that treating mild hypertension will prevent future strokes and heart attacks. It is necessary to keep in mind that all drugs which have the potential of doing something good for you also have the potential of doing something harmful."

Perry says there are other ways of handling the mildly and intermittently hypertensive patient besides with pharmacologic treatment. For example, smoking increases the complications of hypertension and all hypertensives are therefore asked to quit smoking. Weight also contributes to hypertension, and the overweight patient is encouraged to lose weight. Lowering the

amount of salt in the diet and leading a less stressful life are also helpful. Sometimes this is sufficient to control mild and intermittent hypertension.

"If drugs can be avoided," Perry says, "we avoid side effects and the good chance that a mild hypertensive, as a result of therapy, might feel somewhat worse. What worries me is taking large numbers of people and giving them just a little bit less zest for living. For some people just identifying them as hypertensive labels them and produces a change in lifestyle and outlook. I really do not want to do this unless I can be sure that it is going to do some good."

"It is particularly important for a person to have regular blood pressure checks, because high blood pressure in most cases produces no symptoms until one reaches the severe stages of the disease. The most severe type of hypertension does produce symptoms; in particular, impaired vision (because of broken vessels in the eyes), or vomiting (associated with advanced kidney failure). If high blood pressure is discovered before it gets to this stage, the patient can be carefully monitored and when necessary treated with drugs to avoid progressing to a more serious form," Perry says.

"People do not die from hypertension but it is important to remember that they do die from its complications. Hypertension makes certain things, particularly heart attacks and strokes, develop more often and happen faster than they otherwise would."

Perry says if everyone who has hyperten-

sion were effectively treated for it, three-quarters of the strokes and half of the heart attacks in this country could be eliminated. "This is never going to happen," he says, "but we could come a lot closer."

When caring for an individual patient, Perry says it is necessary for him to maintain a good rapport with the patient over a period of years. "I am more interested in the quality of the care I give than the quantity of patients I see. It is important to sit down and try to understand a patient's problems," Perry says.

"For the hypertensive patient to be told to 'relax' is a rather meaningless statement, unless the physician dealing with the patient can really do something to help him relax. Sometimes he can do this by removing from him some of the responsibility for his health. Good patient rapport involves taking the time to listen to the patient and convincing him that you care."

"If I could get a mildly hypertensive patient to give up the high paying executive job which keeps him constantly under stress and get him to become a forest ranger, perhaps I could cure his hypertension. Since I have not been able to do that too often, I am not sure," he says.

According to Perry, it becomes apparent in treating a hypertensive patient that the physician must deal with the whole patient. The man who wants to be a forest ranger already is one. The stress producing lifestyle or career is something a person chooses.

"The physician has to keep his advice rea-



Sven G. Eliasson, M.D., Ph.D., professor of neurology and associate medical director of The Irene Walter Johnson Institute of Rehabilitation.



H. Mitchell Perry, M.D., professor of medicine and head of the Division of Hypertension.



David H. Alpers, M.D., professor of medicine and head of the Division of Gastroenterology.



sonable if he wants to have any chance of selling it to the patient. To tell the patient to stop smoking, lose 20 pounds, and give up salt entirely, all in one breath, is usually unrealistic."

Perry says he tries to discover what each individual patient wants to do, what he views as important in his life and what he can tolerate. "I will outline the things in the patient's life which decrease or increase stress and let the patient choose which of these things he wants to work on. Then I try to help him all I can."

A particularly urgent problem in the area of mild hypertension is periodic follow-up. Somewhere between one and two percent of mild hypertensives, according to Perry, will go on to develop more severe hypertension. It is very important that the appearance of severe hypertension be detected as early as possible.

"For those patients in whom treatment is indicated, it is important for the patient to comply with the treatment program as well as he can," he says. "Patients will sometimes leave a physician's office with a plethora of different medicines, only two or three of which are really important. The fewer the pills and the fewer times a day that the patient has to take them, the more likely he is to comply with his regimen."

Perry says that it is possible to estimate the risk of someone between the ages of 35 and 40 developing a heart attack or stroke. "Four things are major risk factors: family history of stroke or heart attack, high blood pressure, smoking, and a high cholesterol level. Of course, one cannot control his family history, but smoking and high blood pressure can be controlled. It is also worth noting that the lower a person's blood pressure is within the normal range, the less chance that person has of developing a heart attack or stroke. Each increment in blood pressure increases the chance that person has of developing complications; except at the highest pressure levels, it's a linear progression."

According to Perry, women have more hypertension than men, but they do not get into as much trouble from it. This is thought to be because premenopausal women are hormonally protected from atherosclerosis.

"At any time during a person's life, blood pressure may be high during a stressful situation. It has been suggested that people are generally under more stress than their parents were," Perry says. "In all walks of life we are living a faster lifestyle. The pressures

on us are greater. The only thing that can be done about this is to educate a significant segment of society to deviate from its usual success-oriented goals which sometimes place unreasonable demands on all of us.

"I know stress contributes to hypertension," Perry says. "I simply haven't learned how to change it."

Reorganizing our society seems to be a difficult approach; research into ways to treat, cure, and prevent hypertension seems more potentially rewarding. "At the present time," Perry says, "there are two major immediate research needs. We need to discover the best ways to get patients with moderate and severe hypertension to stay on their medication and we need to know whether pharmacologic treatment of mild hypertension is truly valuable. Above everything else we need to discover the cause of

hypertension so that we can learn to prevent it. At the present time, we can treat it and control it. At some time in the not too distant future we'll probably be able to cure it, but we won't have it licked until we can prevent people from developing it," Perry says.

In the meantime, the physician must treat the hypertensive patient with medication and counsel him as to how his stressful lifestyle contributes to his ailment.

"Now that physicians have more tools to use, they sometimes don't use their best tool—which is common sense and sympathy," Perry says. "People suffering from hypertension need to be reassured. The mildly hypertensive patient just might calm





down toward normotension if he truly feels someone is taking the responsibility for his care.

"I know stress contributes to hypertension," Perry says. "I just haven't learned how to change it. If one of my patients has made a choice in his lifestyle which contributes to his hypertension, I don't know if it's my place to change it. I have the responsibility of telling him what he does that contributes to his hypertension, but to be judgmental and tell him he can't do it is another story.

"The only thing I can do for a patient is attempt to get him in better shape, which will lower his blood pressure, make him feel better and increase his longevity."

As stress related illnesses become more prevalent, more and more physicians are recommending the use of biofeedback as a form of treatment. Biofeedback, which is a means of controlling the autonomic nervous system, teaches the patient to control unconscious bodily functions.

Since November of 1974 the Department of Psychiatry has operated a biofeedback clinic at Jewish Hospital under the direction of Kenneth Russ, Ph.D., a clinical psychologist in psychiatry at the School of Medicine.

"We usually have limited feedback as to what is going on inside the body," he says. "Most individuals have no reliable subjective awareness of the ups and downs of blood pressure, changes in brain wave rhythm, fluctuations in the state of muscles and many other functions."

Russ says sensitive electronic equipment can be used to give patients such awareness. Electrodes are attached at various points on the body in order to detect small internal fluctuations. The patient is aware of these detections, usually through sound or visual feedback.

"This feedback lets the patient know what physiological functions are changing from one moment to the next," Russ says. "For example, in headache patients there is an increase in blood flow in the vessels of the head and neck.

"Biofeedback has been used for several years in a very specific way in terms of teaching these individuals how to produce a diversion of blood flow from the central portion of the body out to the peripheral parts," Russ says.

Although the mechanisms of learning are still somewhat unclear, it appears people, through repeated practice, can induce in themselves the body or mind state which

creates this blood flow. In many cases it has been proven that a person clearly can learn this kind of behavior. In fact, in other cases people have learned to lower their blood pressure, relax muscles or even change brain wave patterns.

"In repeated practice sessions at the clinic, migraine patients learn to increase the blood flow out to the body," Russ says, "and this is usually associated with a decrease in the intensity or frequency of their headaches. On the other hand, tension headache patients learn to reduce the tension of their frontalis muscle, a muscle which has been implicated in chronic elevated muscle tension disorders. We have data which proves that at the end of nine months 80 per cent of patients who received biofeedback treatment for headaches experienced a decline in frequency and intensity of headaches."

Before receiving biofeedback, a person is interviewed and given a thorough neurological evaluation.

"If the person seems to be clinically motivated, understands the kind of cooperation which will be required, and we have ruled out the potential contribution of organic factors or other disease processes we accept the patient," Russ says.

"There is, unfortunately, little systematic data at this point as to which patients will be successfully treated. However, it should be pointed out that there is no evidence that age per se or length of illness is a major factor affecting outcome."

Russ says the clinic has about 1200 patient visits a year, excluding research patients, with the majority being for headaches. "However," he says, "we are also involved with problems which are related to anxiety, muscle spasms, and elevated blood pressure levels."

Currently, Russ and his colleagues are examining different issues involved in biofeedback. For example, with the cooperation of some Medical Center neurologists, his group is studying the comparative effectiveness of chemotherapy versus biofeedback for headaches. "As yet there is no systematic data which compares matched groups of patients for these different approaches," he says. "All too often, biofeedback has been a treatment of last resort; perhaps it should be employed earlier, before the patient has attempted other kinds of approaches, in order to maximize its effectiveness."

Russ points out that it is important to

remember that in order for biofeedback to be a worthwhile treatment, the problem must be functional or stress related, not anatomical or chemical in origin. For example, a person afflicted with hypertension due to job tension is a good subject; someone with hypertension caused by renal problems is not.

Eliasson says some of his patients have benefitted from the biofeedback program, but he does note the program is a lengthy one and not every patient is attuned to re-





laxing the proper muscles.

"I can't always tell if a patient is a good candidate for biofeedback, but I do try it if all else fails," Eliasson says. "The idea is for the patient to relax the muscles from which the pain originates. However, the patient isn't really working on the causes for the stress and tension.

"The patient may have acquired a way in which he can get rid of today's headache, but if he doesn't work on the cause of the stress, the headache will be back the next

day when he faces the same problems. Biofeedback can certainly be useful, but I feel it is very important for the patient to try and understand and work on the cause of his stress rather than simply concentrating on easing the symptoms."

Russ points out that it should be recognized that biofeedback also involves discussion of problems with the patients assigned to biofeedback therapists.

"It would be a mistake to assume that all that needs to be done is hook up the patient

to a machine," he says. "We are very interested and discuss with our patients the apparent cause of their headaches. When it is appropriate or beneficial, we counsel and carry out psychotherapy with our patients."

It is impossible to avoid stress, but we all can learn to handle it more effectively by maintaining reasonable control over ourselves and our lives. We should be aware of the effect life change events have on us, such as those listed in the Holmes-Rahe scale. It is important to anticipate life changes whenever possible, evaluate how we feel when a change does occur, and think about ways to adapt to these events.

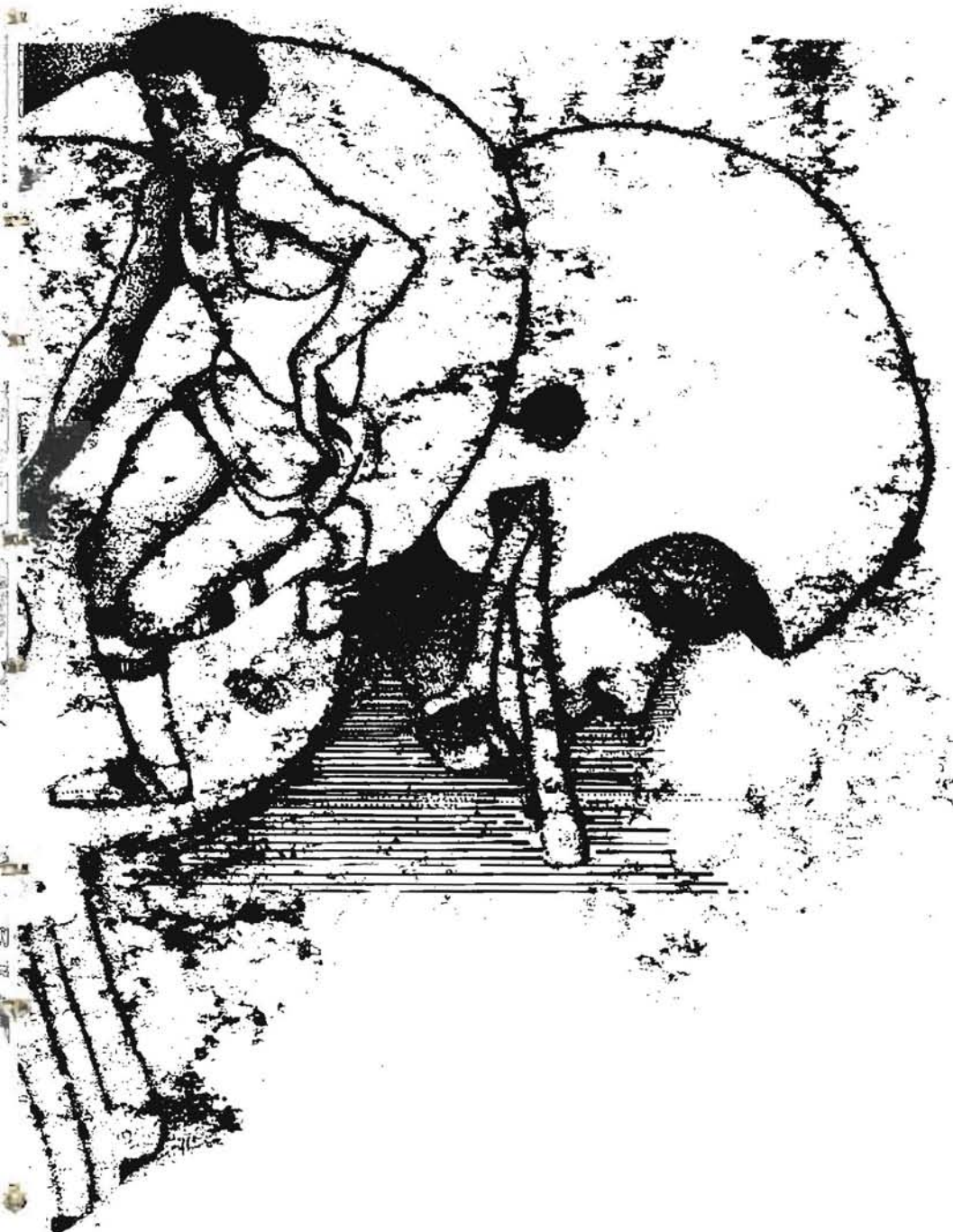
We should also not hesitate to be open about our feelings and seek professional help when stress eventually begins to affect our health.

Alpers, Eliasson and Perry all agree that the physician who deals with stress related illnesses must act as counselor to his patients. It is especially important to take the time to listen to the patient, understand what is happening in his life and gain his trust so that good physician-patient rapport is established. All agree that, even though the physician can and should offer advice, he should not be judgmental with the patient's choice of a lifestyle.

The physician needs to keep in mind that the quality of the patient's life is an important consideration when deciding on treatment procedures. He must consider each individual patient's needs when deciding what to ask him to give up. In his role as counselor, the physician can help each patient decide what stress producing situations can and cannot be eased. By not asking the patient to give up everything he enjoys, patient compliance with his treatment program will usually be increased. This is especially important since most of these patients are seen on a long-term basis.

Stress related illnesses are on the increase because of our society's fast paced lifestyle and the value placed on money and success. Constancy also seems to be a thing of the past; change has become the prevailing life mode. These conditions do make life more stressful for the individual, but in many instances it may be the individual who is responsible for the conditions, or who is certainly responsible for worsening them.

The physician who treats the individual under stress can help him examine his life, take on some of the responsibilities for his care and, in so doing, help him set the proper priorities to improve his own health.



# Carl Harford, M.D.: Caring, dedication, hard work

By Glenda King Rosenthal

**Carl G. Harford, M.D., graduated from the School of Medicine in 1933 and has spent the past 40 years on the full-time faculty. Two years ago the Annual Carl Gayler Harford Visiting Professorship of Infectious Diseases was established. This professorship was established by the Division of Infectious Diseases of the Department of Medicine with funds from Mr. and Mrs. Meyer Kopolow, who are grateful patients. The professorship is a tribute to Harford's many contributions to the University and his excellence as a physician.**

Fifty years ago Carl G. Harford, M.D. '33, professor emeritus of medicine and former chief of the Division of Infectious Diseases, graduated from Amherst College majoring in philosophy and history. He had done some premedical work, but by the end of his junior year his love for philosophy overcame his love for organic chemistry. He had decided not to be a doctor but had not yet decided just what to do with his life.

"I returned to St. Louis and finally got a job at Monsanto by answering an ad," Harford says. "I worked there for five months and realized I didn't like it. I was always going through a slum area to get to work, and I became aware that I was never doing anything to help alleviate those conditions. Seeing those slums had a tremendous effect on me. At this point I decided I did want to become a doctor, so I took the rest of my requirements and entered Washington University in 1929."

When Harford graduated from the Medical School in 1933, he took an 18 month internship at Barnes Hospital. For six months he worked in the Diagnostic Bacteriology Laboratory doing research.

"This was a particularly exciting time to be there," Harford says, "because 1933 was the year of the St. Louis encephalitis epidemic. I had the privilege of working alongside Dr. Ralph Muckenfuss, who was in charge of the laboratory, and Dr. Howard McCordock, who was then head of the Department of Pathology. They were leading investigators of this disease, and many people also were here from the Public Health Service. It would have been a stimulating experience for anybody, but especially for a young medical graduate."

Harford says the equipment used in this laboratory was terribly unsophisticated compared to what is now used. Tissue cultures, which are now used to recognize viruses, were not even in existence.

"The way one recognized a virus," he says, "was to inject various kinds of experimental animals with portions of the brains of patients who had died of a dis-

ease. We would use mortars and pestles to grind the material and then inject it into the animal. In fact, during this epidemic, all of the monkeys from the St. Louis Zoo were sent over here."

One of Harford's jobs was to take daily temperatures on monkeys, a job which he later learned could have been terribly dangerous. "When I look back on it, I realize there was some danger involved," he says. "It has been discovered that monkeys carry a virus called B-virus, which causes a severe, fatal infection. Of course this wasn't known in 1933."

Harford's interest in infectious diseases was heightened through his experience in the Diagnostic Laboratory. After he finished his general medicine internship, he spent a year working with Dr. Jacques Bronfenbrenner, who was then head of what was called Bacteriology and Immunology; it is now Microbiology.

"After I finished my work with him," Harford says, "Bronfenbrenner got me a two year fellowship with Dr. Peter Olitsky at the Rockefeller Institute for Medical Research in New York City. It was there that I became acquainted with Dr. Albert Sabin who developed the oral vaccine against infantile paralysis. I got to know him quite well and received a lot of training and stimulus from him."

After his two years at the Rockefeller Institute, Harford returned to St. Louis and entered private practice with Dr. William Olmsted. However, he continued with research in the Department of Bacteriology and taught infectious diseases.

"I did this for about five years," he says, "and found it to be very difficult timewise. It also was terribly frustrating. I would get my labile reagents out on the desk, get a call, and then have to go see a patient. Because we didn't have the means to preserve viruses, my whole experiment would be ruined."

In the early 1940s Dr. Barry Wood arrived at the School of Medicine and became Chairman of the Department of Medicine. Harford describes him as a



dynamic man with a strong personality who had the ability to influence people.

"Wood had a real interest in infectious diseases; and he knew that I was also interested," Harford says. "When he offered me a job on the full-time faculty, I gladly accepted and have been here ever since. I look on Barry Wood as one of the important influences in my medical education. He had a remarkable ability to get people to work together, and he always referred to us as his team. I felt a personal loss when he left; he had encouraged me tremendously and I learned a great deal from him."

When Wood left to go to Johns Hopkins, Dr. Carl V. Moore became the Chairman of the Department of Medicine and continued to encourage Harford in his infectious diseases research. "Carl Moore was another physician who had the ability to get people to work together," Harford says. "He was a humanist, the type of man who would take the time to talk with his patients. I still find myself telling some of his stories to my students. He taught me an important lesson—if the patient has something to say, listen to him."

During this time, Harford was asked to teach the bacteriology courses when the department head died and a new chairman had not yet arrived. "The man who finally came was Dr. Arthur Kornberg, who eventually won the Nobel Prize for the work he did here," Harford says. "I got to know him quite well because I turned the department over to him and continued to work in his laboratory for 18 months studying DNA. It was fascinating to work with a pure scientist, as opposed to an applied scientist."

Through this experience Harford discovered that he needed the clinical aspects of medicine for his own satisfaction, even though he recognized the tremendous advances which came out of Kornberg's type of research.

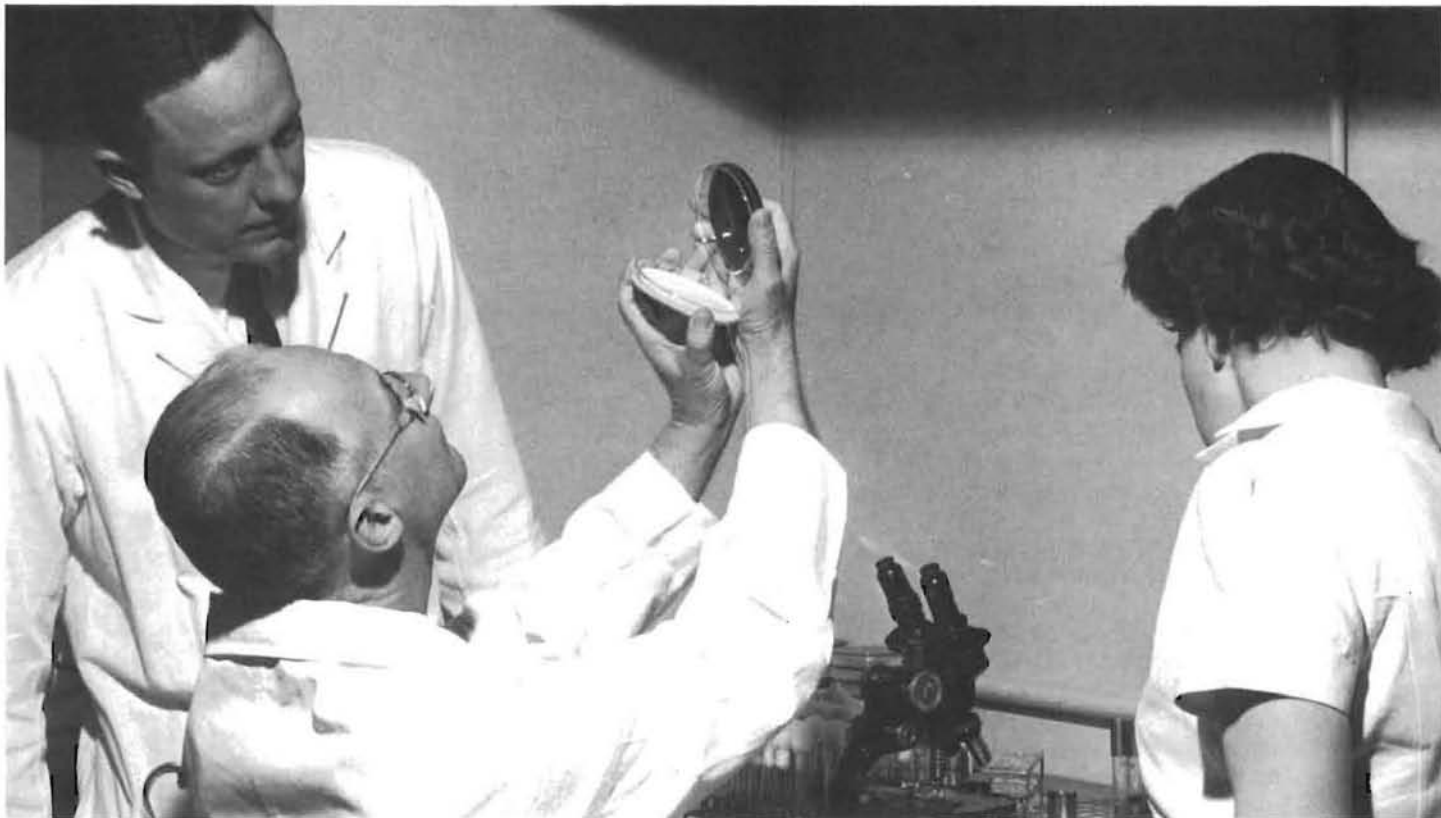
"We need both pure and applied research," he says. "There was a time when people would argue about which was more important, the history and physical or the laboratory work. Nobody argues about that anymore; they're both recognized as essential. In my opinion, the same holds true for pure and applied research. It's important to find out what's going on whether or not you can do something about it. My career has

been a combination of pure and applied research."

When Carl Moore established the infection committees, Harford became the first Chairman of the Barnes Hospital infection committee and had constant clinical experiences. He says in those days certain rooms were set aside for the isolation of patients.

"For many years the City of St. Louis operated the St. Louis City Isolation Hospital for patients with all types of contagious diseases," Harford says. "There were wards full of patients with scarlet fever, erysipelas, typhoid fever, and other contagious diseases. I took students there once a week. On one occasion when there was a case of smallpox, we vaccinated the students as they entered the building. Even though we used isolation precautions, I did get scarlet fever and became a patient in St. Louis Children's Hospital."

"Precautions also were taken at Barnes Hospital. In the building which preceded the present Peters Building, rooms were set aside for the purpose of isolating contagious patients. Since I worked with infectious diseases, I treated and consulted on patients in this area."



*Harford in his laboratory approximately 20 years ago with M. Kenton King, M.D., who is now dean of the medical school.*



According to Harford, the arrival of antimicrobial agents had a tremendous impact on the field of infectious diseases and revolutionized the way in which erysipelas, scarlet fever and many other bacterial diseases were treated.

"Before sulfa drugs became available," he says, "the main things we did were to watch the patients and take care of their symptoms."

"It was a real breakthrough when the sulfa drugs came out. One of these drugs was used in the Isolation Hospital, and it was just electric to see how it worked. We would make rounds in the morning and see if the patient was on THE drug."

After the arrival of the sulfa drugs, penicillin and many other antibiotics followed in close succession. When penicillin came out, Harford says, Dr. Barry Wood was on a national committee to study penicillin to see whether or not it was a valuable drug.

"Because of him, we had penicillin for experimental use," he says. "Dr. Wood brought it back to this hospital and I spent a lot of time deciding which patients should receive it. The criterion I was asked to use was not whether it would help the patient, but whether it would demonstrate the value of the drug."

"We didn't start using it on subacute bacterial endocarditis, which is a fatal disease if left untreated, because we thought it was too horrendous a disease for penicillin to affect. And then one day somebody broke the rules and treated a patient with this disease with penicillin, and lo and behold, it worked!"

"It was an extremely exciting time when we realized the drug was actually working, and we began treating many varying diseases with penicillin."

According to Harford, people began saying infectious diseases were conquered with the discovery of antibiotics. Of course it didn't work out that way; instead it became a much more complicated and sophisticated area. However, the scope of infectious diseases has changed considerably with the control of so many formerly treacherous contagious diseases.

"On a global scale diseases, such as schistosomiasis, still affect very large numbers of people," Harford says. "Also, malaria is still a major threat in India because there are so many people and so little drugs to go around. So the parasitology area of infectious diseases is one of the areas which still has new frontiers to conquer."

Harford feels research into viral diseases is another area to be conquered in infectious diseases. Throughout his whole career at the School of Medicine, he has spent a great deal of time working in this area.

"My beginning research effort during the St. Louis encephalitis epidemic was in the area of virology," he says. "My work with Dr. Olitsky was in a virology laboratory. I've also been interested in bacterial pneumonia and influenza throughout the years. A major problem with influenza is that the patient oftentimes gets a secondary bacterial infection. I was interested in trying to find out why this was, so I reproduced the disease in mice. I then reproduced the combined disease in mice and found that pulmonary edema from the virus infection was a major contributing factor. I've studied this over a period of years."

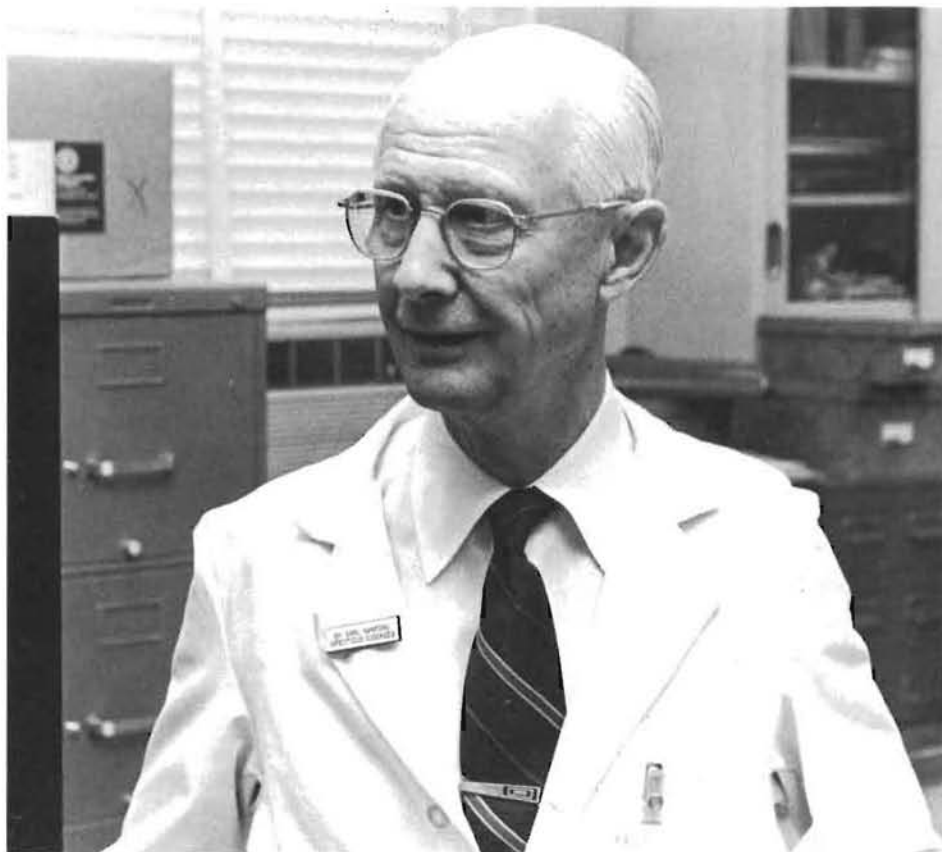
"I am still working on viral diseases in my laboratory. I'm interested in finding newer methods of rendering cells more susceptible to viruses so that they can be used to isolate diseases of previously unknown etiology," Harford says.

Treatment of the immunosuppressed pa-

tient is a new area in infectious diseases which has built up gradually over the years. According to Harford, the benefits which can come from certain types of treatment is often weighted with problems. It is important for an infectious diseases specialist to aid in the care of these immunosuppressed patients.

"The patient under treatment for cancer is a good example of this problem," Harford says. "The patient is given x-ray and cobalt treatments, then three or four drugs and usually corticosteroids. This combination of treatments will sometimes cure the cancer, but in addition to that, they destroy the patient's immunity against infection. It is now one of the main jobs of the physician who works in infectious diseases to help treat patients who have acquired infections in this manner. The treatment of the immunosuppressed patient is an important new area in infectious diseases."

In many ways, since the advent of penicillin and the other antibiotics, the burden of the infectious diseases specialist seems to have lessened. It has, however, become apparent that, with advancements in other



*Carl Harford, M.D., professor emeritus of medicine.*





*Harford with a patient at Washington University's Medical Care Group.*

medical fields, whole new areas of infectious disease problems are opened. For example, the more advanced surgery becomes, the more likely the patient is to acquire a secondary infection and be in need of an infectious diseases specialist.

Harford feels that even though the infectious diseases specialist is often brought in as a consultant, he should also serve as a primary care physician.

"Over the years I have served as primary care physician to many patients because that patient had needs; he needed someone who would treat him as a whole," Harford says. "In my opinion, every specialist needs to see all the problems of the patient in perspective and see to it that aspects of the case not in his area of expertise are cared for appropriately, either by himself or by other kinds of specialists."

Harford says he sees medical students who want to go into research, but many of them are interested in primary care. He also finds the students are concerned with establishing a good relationship with their patients.

"However," he says, "I don't know if good physician-patient rapport has really changed. We still have physicians who have

wonderful rapport with their patients; others don't. It was the same forty years ago. But I do feel that a person who enters the medical profession, even if it is in a research area, must have some sort of humanistic aspects to his personality. It isn't all science; by nature, medicine has to be a people-oriented profession. I constantly see students being stimulated by the positive response they get from patients when they take the time to listen."

Harford says he still gets a tremendous amount of pleasure from teaching medical students. In addition to his laboratory research and time spent at the School's Medical Care Group as a primary care physician, Harford teaches a course in clinical medicine and teaches the students on rotation at the Veteran's Administration Hospital.

"I've always found the students are more stimulated when I let them use their own judgement as much as they can," he says. "After they've spent time with the patient, I sit down with them and have them tell me their opinion. I use what was the most effective way for me to learn—the Socratic method."

Harford feels the combined clinical and

research aspects of his career have given him the best of both worlds. "I was selfish," he says. "So I saw patients, taught clinical medicine, and had my laboratory. I do think I would have made more progress in my research if I hadn't done anything but that. Yet, I've always believed that doing research has helped me in clinical medicine and vice versa."

The desire to help others prompted Harford to enter medical school and it has never left him. After 40 years on the faculty, his patients still come first, and he continues to instill this philosophy in his students.

"When I decided to enter medical school, my father brought me here and had me talk to William Bahlman Parker, the registrar for many, many years," Harford says. "He told me something I never forgot. You don't have to be a genius to be a doctor. You just have to care for people, be dedicated and work hard. Over the years, I've come to believe it was some of the best advice I've ever gotten."

"History and philosophy have remained my avocation and I've never regretted my decision to enter medical school. I've had a wonderful career here; the School is a part of me."



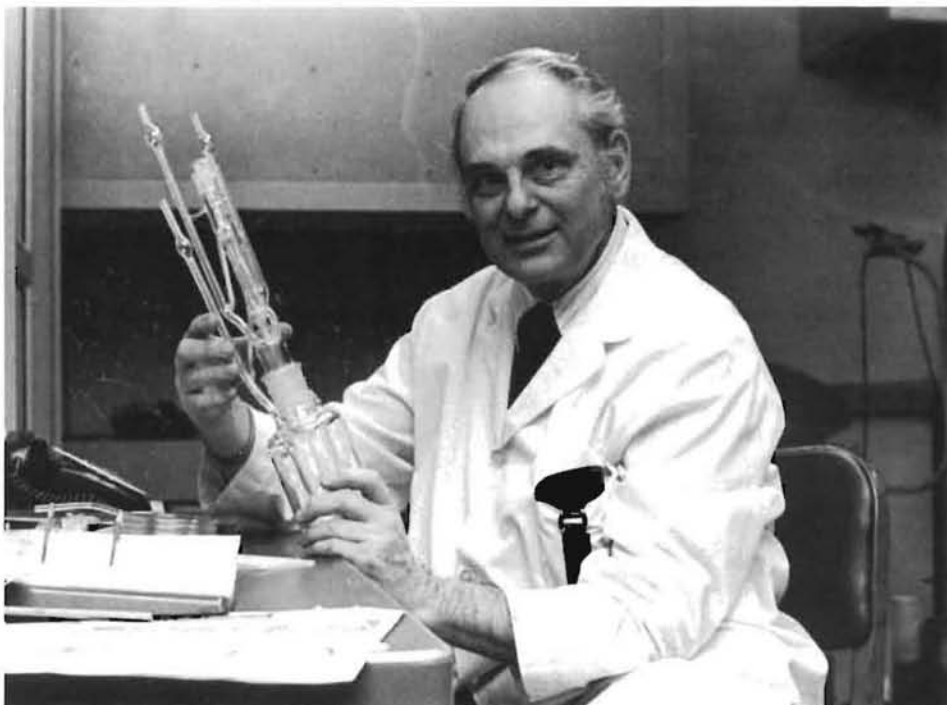
# An ancient art assists medical research

Harry Huth is a craftsman practicing a skill which is more than 50 centuries old and which provides important tools for medical research.

Huth is the School of Medicine's glassblower. WUMS is one of three medical schools in the country which employs a glassblower to assure that glassware for research projects is available.

Huth usually works with the investigator or technician to design glassware which cannot be obtained anywhere else. The glassware is invented to facilitate specific research goals when the researcher realizes his project will not work with the standard size, shape or function of catalog glassware.

"I take a piece of glassware and modify it to do something original," Huth explains. "It's a very creative and rewarding job." Huth is one of ten professional glassblowers in St. Louis and 1,000 in the United States.







# Profile of the freshman class

By Katherine S. Robbins

**Ranging in age from 18-37 years, the median age of the 1977-1978 WUMS freshman is 21 years old. The 120 students in the class represent a cross section of backgrounds and experiences. The 32 women and 88 men represent a total of three foreign countries, including Canada, China and Korea, and 33 U.S. states. Eighteen are residents of Missouri. Thirteen are members of minority groups. There are 58 bachelor of science degrees and 64 bachelor of arts degrees. Eight students hold masters degrees, and three hold Ph.D. degrees.**

In the WUMS freshman class there is evidence of a new awareness emerging. Coupled with the desire to pursue work that is self-fulfilling while helping and changing the lives of others, members of the class exhibit a concern for treating the whole person.

John C. Herweg, M.D., associate dean, Gerald T. Perkoff, M.D., director of the Division of Health Care Research, and Roy R. Peterson, Ph.D., professor of anatomy and neurobiology, are in close association with the 1977-1978 freshman class. In their varying capacities they have dealt with the class from the stage of applicant to second semester student. The three have observed the evolving personality of the class, their attitude towards medicine, their motivations for pursuing medicine as a viable career, and their reactions to the potential process of dehumanization.

A heterogeneous group when they enter medical school, each class gradually develops a personality through the interaction of all the different individual personalities. By accident, certain individuals set the tone of the entire group only because their personality is so strong that it affects the others. "As a group, the 1977-1978 freshman class is more concerned with cooperating together than competing against one another than some classes have been in previous years," says Herweg.

Stressing the cooperative spirit, Peterson adds that the class "is one of the nicest classes I've dealt with because of the fact that they don't feel the necessity of grinding an ax. Though not the least bit reticent about stating their point of view, they are both polite and direct in doing so. Without demanding change for change's sake alone, they ask for those things which they feel might help their understanding or grasp of things."

Perkoff notes that the class identity has changed progressively over the years. Referring to the Introduction to Social Medicine and Medical Ethics course, Perkoff says, "It was first established during an activist time when the criticism of the students was ap-

propriate in kind but often inappropriate in degree; it often turned into a shouting contest. It was all very extreme. Then we went through an apathetic time when I talked to an auditorium of empty seats. Today they are active intellectually, and goal oriented in the positive sense. They want to do good things. I wouldn't give up being in contact with them for anything."

The prevailing attitude of the freshman class towards medicine is that it provides a unique opportunity to serve society in a constructive manner, to relieve stress and alleviate suffering. Medical school provides the environment for the development of the skills that are utilized in the role as health care provider. Throughout the four years of medical school, the students integrate their original commitment to the philosophical idea of medicine with the technical skills they acquire. "Patients want to have a concerned person as their physician," says Herweg.

As freshmen, the students are immersed in the scientific rather than the clinical principles of medicine. By the time they become seniors there will, presumably, have been effective integration of the two principles. But according to Perkoff, "It is a relatively easy phenomenon to become caught up with interpreting the results of tests, and lose contact with the patient."

Referring to the Introduction to Social Medicine and Medical Ethics course, Perkoff continues, "The freshmen were the best informed yet about medical questions. They came with information, questions, and particular sensitivity to the discussions of the ethical issues of life and death. They were thoughtful as to the boundaries between medicine and socioeconomic considerations, such as whether or not someone can afford and effectively deal with the ramifications of medical care."

Conscious of the rising costs of medical care, the students cling to high motivations and ideals for pursuing medicine as a viable career: the mental challenge it provides, the opportunity for perfection of skill, and the occasion for human service.



Today, students look more analytically at their own career. They seek out opportunities to find out about the field from firsthand, medically-related experiences. According to Herweg, "Those students who have been accepted to medical school have indicated their interest through action. Rather than simply verbalizing the old stock answer 'I like science and I want to help people,' they have explored more fully what medicine is all about by involving themselves in activities such as candy stripping, emergency room aide work and research."

Peterson comments, "The students are self-disciplined for the most part, and their motivation comes from within. They're in with a group of high achievers who, obviously, also need a strong interest and competence in science to go along with their practical experience."

The notion of a dehumanization process taking place during the four years of medical school is often precipitated by an unrealistic view of the medical school experience that students themselves hold.

In medical school the students are totally immersed in learning and adjusting. Peterson explains that, "They are taught a framework and guiding principle to utilize in approaching information. This is extremely helpful because they must assimilate a tremendous amount of material."

The greatest difference between medical and undergraduate school is that every medical school course requires retention of such an enormous amount of information that letting up and coasting is strongly discouraged. The students are hard pressed to find the time to become involved in activities that are not academically related. "As a result,"

continues Peterson, "some of them tend to become almost anti-social, and that is not good for their learning, nor for their personal lives."

Medical school, a dissimilar experience from the undergraduate years, elicits both negative and positive manifestations. From a negative standpoint, there are significant time demands. Due to the unpredictable, lack-of-routine nature of the profession, students and residents are kept extremely busy, and obligated to work many long hours. It is a consuming lifestyle.

Yet from a positive standpoint, medicine allows for a feeling of growth. Never boring, it is an intellectually challenging profession that combines technical expertise with face-to-face human contact: human lives are a physician's business. The independence it affords is another positive factor. A physician has extensive freedom to choose what aspect of medicine to pursue and where to pursue it.

Perkoff says, "There is a professionalism process that goes on throughout the four years of medical school, so that by graduation the students are not the same people. The freshmen are active, intellectually vigorous and full of good will. They can handle the ethical and philosophical questions posed in the Introduction to Social Medicine and Medical Ethics course, but after four years in medical school this ability has been professionalized right out of them. At the very least, it is well-hidden." From his association with students during teaching rounds on the wards, Perkoff observes, "Just the reverse of the freshmen students, the seniors frequently are uncomfortable being taught about medical care. They are more at

ease with the scientific principles for treating disease."

Referring to the Introduction to Social Medicine and Medical Ethics course, Perkoff adds, "The students participated heavily in class discussion, and were remarkably aware of the ethical and philosophical problems."

The 1977-1978 freshman class is giving serious consideration to the apparent dichotomy between professionalism and empathy. They question the necessity of having to choose to be "professional" at the expense of being human, to be precise at the expense of being relevant, and to be successful at the expense of understanding a patient and their health.

To avoid having to make such choices, Herweg suggests, "The students need more time to think about and assess who and what they are and where they are going."

In this age of technology and specialization, the relationship between patient and doctor, once characterized by close and compassionate ties, is a tenuous one. It is on the verge of giving way to an anonymous, impersonal practice of medicine. Something more than the cold mechanical application of scientific principles to human disease, medicine embodies the art of healing. It must deal not only with the physical, but with the emotional and psychological problems of a patient as well. To fully comprehend the patient and be completely effective, the exemplary physician must avoid being one-dimensional.

Though recognizing the inadequacies of the old general practitioner and the specialist, members of the class of '81 acknowledge the need for both. Envisioning



John C. Herweg, M.D., associate dean.



Gerald T. Perkoff, M.D., director of the Division of Health Care Research.



Roy R. Peterson, Ph.D., professor of anatomy and neurobiology.



the two as part of a team assisted by para-professionals, they seek to incorporate family practice, specialization, and scientific research in order to stress the availability of top quality clinical care.

The criteria for WUMS admissions stresses the total, well-rounded individual, who

excels in extracurricular activities as well as academics. Of the 6736 applications submitted for the 120 places in the 1977-1978 freshman class, the admissions committee ferreted out those individuals who displayed perseverance, consistency and seriousness of intent to study medicine.

While their individual experiences and preparations for medical school are dissimilar, they express a similar concern for the direction of medicine and the treatment of the total person.

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## Ten student profiles

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"My primary goal is to be the best physician that I am capable of being. The key is to remain more socially than self oriented, and to keep things in their proper perspective," says KIMBERLEY ALEXANDER.

A zoology major at Pomona College in Calif., Alexander prefers the biological to the physical sciences because of their animate nature. "Zoology is such a dynamic discipline! I thought that if I didn't get into medical school I would choose to do something in the area of biological sciences. Practicality aside, I opted for spending the rest of my life doing something I enjoy," she says.

Following high school, Alexander spent a year in Holland with a Dutch family as part of the Youth for Understanding program. It was in Holland that she gained experience working with the mentally handicapped at the Huis de Weiport, a state institution. The ten hour work day was spent in various activities from assisting with occupational therapy to supervising the quotidian tasks of bed making. For the future she considers "Working with the handicapped in some fashion is still a predominant thought."

Keeping an open mind regarding career opportunities, Alexander continues, "When I find the area of medicine that interests me more than any other, I will give it my all. At this point in time it is still too early to know for certain." While admitting that medicine is demanding and time consuming, she appreciates the potential freedom it offers, and the opportunity for active involvement.



*Kimberley Alexander in the McDonnell cafeteria.*



According to JIM ASHTON, a competent physician is a "person who feels comfortable talking to other physicians as well as patients. They are adaptable." His own pediatrician fit this description, and was responsible for "planting the seed. He would put me in his car with him to go see other kids with 'sniffly' noses. I liked his lifestyle and concern.

"I've found that it helps when embarking on a journey to have some kind of goal in mind. Otherwise, a lot of time can be wasted." With that thought, Ashton put himself through Michigan State University with summer jobs as a welder, machinist, and a mover for a moving company. Because of the nature of the work, he built up a resentment, finding it stifling to work under someone. Preferring the autonomous nature of medicine, Ashton is attracted to the idea of selfemployment where the patient is boss. "I help the patient through my knowledge," he says.

Having been accepted to medical school, Ashton feels that graduating with a degree in biochemistry was unnecessary. Because of his limited exposure to the humanities, he ponders the possibilities had he taken a major in that area. "But," Ashton continues,



*Jim Ashton spends his free time riding and training horses.*

"I have consciously chosen medical school. It is absolutely essential for me to enjoy what I'm doing."

Though complimentary of the medical school curriculum and structure, Ashton says, "Others spend a lot of time studying. God bless 'em! I feel tremendous peer pres-

sure. If I spend time throwing a frisbee around, I feel guilty. I'm determined not to let it get to me. Studies are the number one priority, but they should not be the only thing one lives and breathes. Grades do not make a better physician."

One of the youngest members of the freshman class at age 20, ARTHUR BREWER has had an interest in chemistry since he was a child, "when I received a chemistry set for Christmas." While always wanting to do something constructive for society, his original decision to become a doctor was based on superficial factors such as the image they portrayed on television.

Brewer graduated with a degree in biology from Colgate University where students are required to work on specific projects during the month of January. "Up until that time I didn't have a personal, one-to-one feeling of what it would be like to be a physician. For my freshman January project I worked with physicians in pediatrics, obstetrics and gynecology, internal medicine and radiology," he says. Exposure to various tasks, such as taking case histories, gave him the opportunity to experience the realities of medical practice. Brewer adds, "I liked it, and I thought that my personality as I knew it could easily adapt to that kind of a lifestyle."

Brewer's sophomore January project was spent working with psychotic patients at a mental health center in Boston. For the month of January during his final year at Colgate, he worked in a genetics laboratory



*Arthur Brewer experimenting in the microbiology laboratory.*

assisting with tests on amniotic fluid at Children's Memorial Hospital in Chicago.

Hoping to serve his residency in a public health hospital, Brewer prefers sparsely populated areas that are in need of medical care. Upon completing residency requirements, he would like to combine clinical medicine with research. "I don't think I could be exclusively involved with one or the

other. Ideally, I would like to teach at a medical school as well as establish my own practice," he says.

For Brewer the competent physician is "one who realizes his/her capabilities and is very compassionate and sensitive to the needs of the patient. Being able to communicate with patients and respond to questions they may have is very important."



Being married to a fellow freshman medical student has its advantages according to LANYARD DIAL. Having known each other since their first year of high school, Mary Benson and Lanyard were married in July 1976. Instead of competing, they compensate for one another's strengths and weaknesses. "We complement each other in many ways," says Dial.

Carrying equal course loads in medical school they have agreed to share the mundane tasks of housework. Having devised a unique system to handle the division of chores, Dial explains, "I am 60 per cent heavier than Mary, therefore I do 60 per cent more of the housework."

A biology graduate from the University of California at Irvine, Dial was a pre-med from the beginning of his college career. During undergraduate school, he participated in the Health Sciences Experiences Program where he had an opportunity to observe the operations of various departments. In his senior year, Dial was able to glean some practical experience from assisting in the emergency room.

"I'm not out to save the world or rid the world of disease. A doctor should enjoy being a doctor, helping other people and doing a job that others will appreciate. It is an opportunity to do something worthwhile so that someone will say 'thank you.' Research does not afford that human contact," he says.



*Lanyard Dial and Mary, his wife, playing backgammon in the courtyard.*

With a masters degree in social work from Washington University and five years experience as a secondary science instructor which include two years at East Ladue Junior High School, JEAN DWYER is integrating her knowledge of the behavioral and biological aspects of human nature with the study of medicine. "The two fields have helped me to relate more effectively to medicine," says Dwyer.

Dwyer's decision to pursue medicine goes back to high school in the early 1960's when she and a fellow female science classmate discussed the possibility of a career in medicine. "My friend wanted to be a doctor. Typical of the way of thinking at that time, she could become a doctor because she didn't want to have a family. I did want a family, therefore becoming a doctor was out for me. A woman couldn't do both. That was the difference then."

Teaching secondary science, as well as previous experience as a camp and college



*Jean Dwyer and David, her husband, playing Oh-Wah-Ree, an Afro-Asian counting game, with their twin daughters Bonnie and Lisa.*



counselor, sparked an interest in human behavior which led to Dwyer's involvement in the field of social work. In the social work program at Washington University she worked closely with Dorriece Pirtle, M.S.W. assistant professor, to whom she attributes much inspiration and the encouragement to best utilize her capabilities. Dwyer helped revise and later taught Pirtle's course "Sex Role Stereotyping Implications for Social Work Practice." Medicine appeared as a medium where scientific training and knowledge of human behavior could be effectively combined.

On applying to medical school, Dwyer

says, "I knew my credentials were good, but I didn't realize how much my age, my kids, and the fact that I had been out for so long were going to be against me." In the interview process she countered the age problem with the comment, "Women live seven years longer than men!"

Dwyer is interested in developing a service which meets both the psychological and physiological needs of people. Leaning towards primary practice in the area of family care, pediatrics or obstetrics-gynecology, she is convinced that "medicine will change from the inside rather than from the outside." She has hopes of creating a health

care facility which would utilize the training and various strengths of the allied health professionals. Social workers, nurses, physician's assistants and physicians would work together sharing their expertise and commitment. "The physician is the authority on biological problems, but not on human relations. The responsibilities should be shared," says Dwyer.

Dwyer has made a conscientious commitment to medicine. She views her future role as a physician as an opportunity to give more than she could give in any other position.

WADEN EMERY III made the decision to postpone college immediately following graduation from Phillips Academy in Andover, Mass. In retrospect it has proved to be a judicious one. Bypassing the traditional route of high school, then college, he took a service oriented job in the business world where he discovered the rewards of receiving instantaneous feedback from people. Working allowed him time to experiment and achieve a balance between social and intellectual pursuits.

Upon deciding to continue his education, Emery enrolled at the University of Oklahoma. He says, "You reach a point when you've mastered all you can and then you either have a lot of hobbies or something with a worthwhile goal." Later transferring to Bethany Nazarene College, he graduated with a double major in chemistry and psychology.

Initially a psychology major, Emery's interest was primarily in counseling because of the face-to-face contact with people it afforded. He was profoundly influenced by the Swiss general practitioner Paul Tournier, M.D., and his philosophy of medicine.

According to Tournier, "The person is not pure spirit; it has a body which acts and feels; and man is one with his work; he reveals himself quite as much by his acts as by his ideas and emotions; and his ideas and



Waden Emery ice skating in Shaw Park.

emotions are but the inner echo of his encounter with the world through action." (*Learn to Grow Old*)

Admitting that the medical school lifestyle is different, Emery says, "It is not necessarily dehumanizing, except for those students who study continuously. Anyone who considers medical school a dehumanizing experience, feels that way because of their own compulsiveness."

Continuing, Emery says, "I have allotted a

certain amount of time for academics, and have taken the initiative to enjoy life. Granted the amount of time I spend on extracurricular activities has decreased, but only because as a professional, proportioning time will become more and more important."

Emery has chosen medicine as a vehicle for working with people on a primary level and maintaining long term patient contact.

"An important part of communicating with a patient is being able to relate to their everyday life as well as their body," says ED ENGEL.

With a Ph.D. in anatomy from the University of Tennessee Center for Health Sciences, Engel feels that there is an advantage in starting medical school several years after

completing an undergraduate degree. He says he is proof that medical schools look for persistence and consistency.

He continues, "Many students right out of college probably don't have a very good understanding of exactly why they want to be in medical school. They've worked hard to get there, but don't always have a good

understanding of their motivations."

Remaining enthusiastic about the WUMS curriculum, Engel has taken all the required courses except anatomy: microbiology, biochemistry and the Introduction to Social Medicine and Medical Ethics. "That course has been around for several years. When I first heard about it I thought maybe it had



something to do with the way a person dressed!" Introduction to Social Medicine and Medical Ethics, a course that the students requested in the late 1960's, deals with the whole health care system. "It is thought provoking, but at this point I'm not sure how helpful because I'm not yet in a position to utilize the information. It's such a personal thing."

Concerning bio-ethics, Engel believes that many people choose their physician because of their bedside manner. He adds, "It's definitely important to pay attention to more than just a patient's physical symptoms, but it's difficult to teach someone to care more about people. Either someone cares or they don't."

Strongly influenced by his father, who is a physician, Engel says he has always been interested in clinical medicine. Ideally, he would like to establish practice in a community in order to get to know the patients as individuals equally as well as their symptoms. Though, regarding his future, Engel is keeping an open mind. "I'm not ruling anything out without giving it a chance."



*Ed Engel and Kathy, his wife, a postdoctoral fellow in neurobiology.*



*Ri Greene in the WUMS library.*

With a Ph.D. in chemical engineering from Princeton University, RI GREENE held a position on the faculty of the University of Alabama, Birmingham. Planning on completing medical school in three years, Greene has hopes of returning to assume teaching and research responsibilities in the area of biomedical engineering. This would involve the application of engineering principles to knowledge gained from his medical school experience.

Because of the volume of information covered in medical school, Greene feels that no one has an opportunity to learn the material thoroughly. "I'm always worrying about how I'm doing because I don't have time to learn things as well as I did in graduate school. It keeps everyone a little bit edgy," he says. Commenting that memory should not be over emphasized, Greene explains, "You have to be very careful not to get bogged down with too much detail, because you can get absolutely mired."

Stating that medical school is an unnatural environment, Greene says, "The younger rather than the older students are more likely to change measurably during medical school because the early 20's are a

time of major decision making and change." Due to time limitations, Greene continues, "We don't see a very big cross section of people as first year medical students, and that limits perspective. It's easy to lose track of the fact that medical students are not the only people who have a demanding schedule."

Having done some work in the past with immobilized enzyme kinetics for the American Institute of Chemical Engineers, Greene is aware of their commercial possibilities. For instance, corn sugar has been converted into fruit toast, and while much cheaper than table sugar, it also competes with sweetness. "People are learning to produce all sorts of products enzymatically," he adds.

"It's important to do something related to people after completing medical school. This is where the comparative advantage lies because engineers, for example, can't treat people in a hospital situation. If they want to implant a particular device they must refer to a physician. I'm hoping to learn enough about medicine so that I can come up with a new idea and help some people out," Greene says.



For ROLAND HAWKINS, medical school presents an opportunity for broadening his own capabilities in terms of biomedical science. Having received his Ph.D. in molecular biology from Washington University in 1967, he went on to serve on the faculty of St. Louis University School of Medicine teaching physical chemistry. "The things I was doing were rather narrow and circumscribed," he says of his teaching experience. Interested in both the clinical and research aspects of medicine, he remains open minded about the direction of his future pursuits.

"WUMS appropriately emphasizes itself as a center of research, and it is that emphasis that is no doubt responsible for the quality of people it attracts: both professors and students. The professors are primarily researchers, and I am pleasantly surprised to find that they are good teachers," he states. As a medical student Hawkins is experiencing the comprehensiveness of the medical school curriculum. "I always knew that the intellectual dimensions were bigger than what I was in contact with as an instructor," he continues.

At age thirty-seven, Hawkins is the oldest student in the freshman class. He says, "I can't imagine being eighteen years old and in medical school. In fact, I can't imagine



*Roland Hawkins working in the anatomy laboratory.*

being eighteen years old!" With the responsibility of family, he finds time to do the things that have to be done, such as "taking out the garbage. There aren't enough hours in the day any more, but there is nothing I can do about that."

Commenting on the role of the physician today, Hawkins feels that, "The physician

should be competent in what he/she does, and disciplined about maintaining that competence while committing fully to medicine. The physician has to respect his/her patients and give them the best. The physician must be intellectually honest in knowing when that is being done and when it is not."

"Going into medicine was the furthest thing from my mind as an undergraduate," says ROBERT PAINE III, after growing up in a physician's family and witnessing the demanding lifestyle. It was not until after he



*Rob Paine playing squash with the world's foremost squash champion, Hashim Kahn.*

had received the bachelor of philosophy from Oxford University and experienced first-hand patient contact as a laboratory assistant at St. Luke's Hospital that Paine considered medicine as a viable career. "I made a rational decision and then went on working to achieve it."

Paine's bachelor of philosophy, equivalent to a master's degree at a U.S. university, concentrated on the philosophy of language. Of the Oxford program he says, "It required a great deal of discipline because of the freedom allowed in planning a course of study. It was an incredibly free atmosphere."

On completion of the program, Paine returned to the U.S. with the intention of pursuing teaching opportunities in philosophy. In St. Louis during the interim, he accepted a position as a laboratory assistant where he discovered an appreciation for patient contact. Inspired, he enrolled at Washington University to fulfill pre-medical course requirements.

Apprehensive about the consuming nature of medical school Paine comments, "At one point I felt I was a fairly decent conver-

sationalist, and I could see that in medical school I could easily lose that in a big hurry. Unless you're another medical student, medical students are boring to talk to. One of the drawbacks of spending all of your time with the same people, is that it causes loss of perspective." Making a deliberate effort to withhold time for activities other than scholastic, he says, "There is no substitute for being well-rounded."

Impressed with the WUMS curriculum, Paine notes, "The students are happy to be here. The difference between medical and undergraduate school is that the competition is tougher and the students work harder."

He continues, "Freshmen medical students are made of ideals. They are impatient to get involved in clinical care situations about which they have strong feelings and intuitions. However, at this point, their emotional view of medicine far outstrips their scientific knowledge. Realizing the need for compassion, their concern is that they will lose that strong feeling along the way."



# Students need help meeting soaring costs of medical education

By Sharon Stephens Murphy

**Students entering medical school may already be substantially in debt. By the time they leave medical school it's possible they may have \$25,000 to \$50,000 to repay. This is a concern at most medical schools where administrators are trying to increase the support they can give to student in loans and more importantly scholarships.**

"I've wanted to go to medical school as much as anyone and I want to be a good primary care physician, but I wouldn't be here if it weren't for financial assistance from the School," says a second-year WUMS student.

His comments are an echo from the past; sentiments and a condition which have oftentimes been experienced by students.

An alumnus of more than 20 years recalls that while the costs were considerably less in his medical school days, they were still more than he or his family could afford. "My parents were farmers and there simply were not extra funds lying around for such an extravagance as medical school. Without financial assistance from the School, I would have unhappily had to go into something else."

John C. Herweg, M.D., associate dean, has been involved with medical student financial aid for almost 13 years.

"During this time the tuition costs and the cost of living have risen dramatically," he says. "Fifteen or 20 years ago if you gave a student a \$1,000 scholarship, it was a big boost. Today that amount doesn't go too far."

Each year the Committee on Student Financial Aid, chaired by Herweg, estimates what the average cost for one year is going to be for a student. "The minimum cost, including tuition and living expenses, for a single freshman medical student during the 1978-79 school year is going to be more than \$8,100 and that's not including transportation, clothing and other incidentals." Those figures are based on a student living in a single room in Olin Residence Hall and eating meals in the Barnes Hospital Cafeteria.

"For a married students," Herweg says, "the costs will be well over \$9,400. When you consider increases in tuition and the cost of living and multiply that cost by four years, it adds up to a lot of money."

"An appreciable percentage of our student body needs help to pay all or part of their expenses," Herweg says.

Ninety-four WUMS students receive full

tuition and stipend support from the U.S. government, 53 through the School's Medical Scientist Training Program (combined M.D./Ph.D. program) and 41 through the National Health Service Corps of the U.S. Public Health Service or the Armed Forces Health Professions Scholarship Program of the U.S. Army, Navy and Air Force. Of the remaining students more than 40 per cent require some kind of financial assistance.

"The Federal government at one time more actively supported medical students through scholarships and loans," says Hugh Morrison, associate vice chancellor for medical affairs. "Over the past few years they have been phasing out their support and it has reached a point where the government has eliminated medical student scholarship aid through the medical schools."

The School does, however, receive loan funds through the Health Professions Student Loan Program. This year's new award provided approximately \$90,000 for loans to WUMS medical students. However, new government contributions to this program are also being gradually phased out.

What this means is that the School must either identify new external sources or commit its own limited general funds to finance its student aid programs.

John Walters, assistant dean for student affairs and a member of the Financial Aid Committee, has estimated the need for student financial aid (loan and scholarships) to be more than \$1 million for next year.

"In my eight years here, we've always been able to financially assist students up to the amount of their legitimate need," Walters says. "Now that our students' cumulative financial needs exceed \$1 million, we must encourage eligible students to seek sources of possible assistance outside the School. These sources are usually loans because very few scholarships exist."

"Several St. Louis banks, including Tower Grove Bank, have been particularly helpful and cooperative in granting student loans."

Because of rising costs, the Medical



School has had to change the way it views financial aid.

"When I was in Dr. Herweg's position, the tuition was \$900 a year," remembers M. Kenton King, M.D., dean of the School of Medicine. "We had funds earmarked or restricted for student aid and therefore gave most financial aid in the form of scholarships as opposed to loans. In fact," King says, "we discouraged loans. We even had a statement in the catalog discouraging medical students from borrowing money. At one time, around 1961-62, this School ranked last in the country for the amount of loan money awarded to medical students.

"What changed was inflation," King explains. "Tuition is now much higher and the endowment fund has not expanded at the same rate as price increases. Its income, while substantial, has not been enough to meet the continuing and growing scholarship needs of the School.

"Gradually, the School has had to shift over to granting a higher percentage of loan money in order to totally meet student needs," King says. "It's no longer considered an ill-advised move for a medical student to borrow money. In fact, because of the limited fund sources available, that's the only way most students are going to be able to finance their education. This situation is not unique to Washington University."

Currently, the first \$3,000 of a student's need is met with loan money. The next \$1,500 worth of need is met with grant (scholarship) money and above that there is a \$2 to \$1 loan/grant ratio.

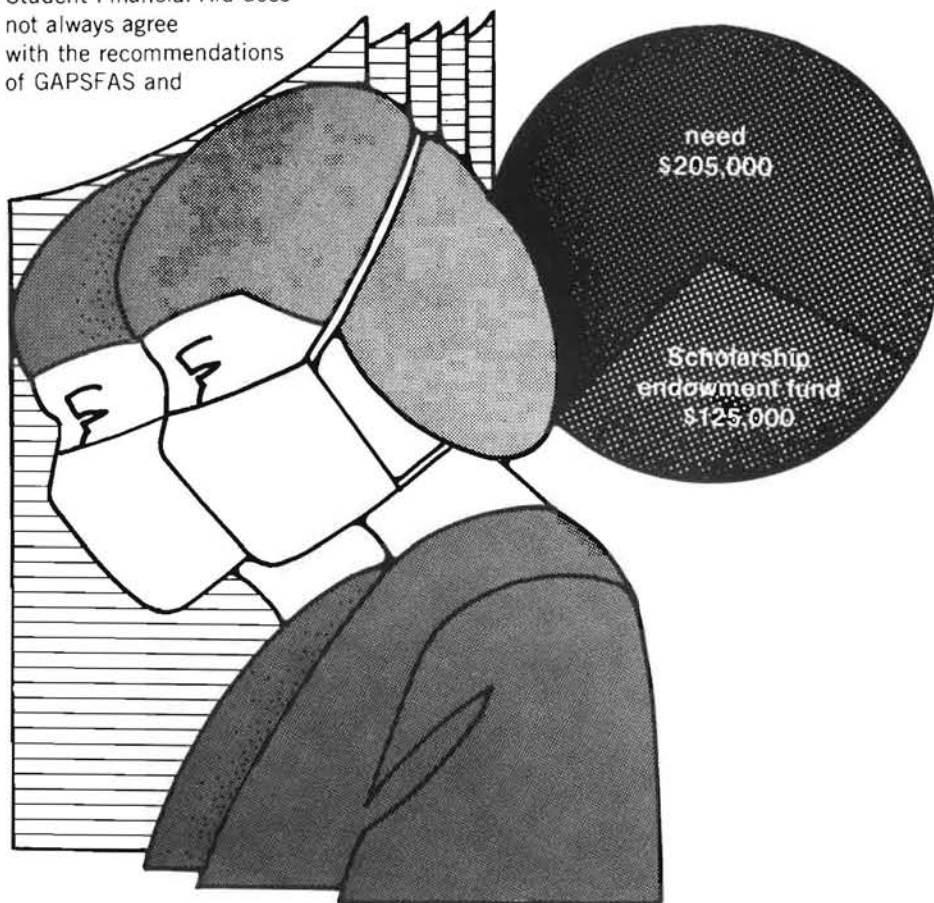
"All financial aid is awarded strictly on the basis of documented need," Herweg says. In addition, he stresses that the Committee on Admissions does not inquire about a student's ability to afford a medical education during the selection process.

"This reflects the Faculty's wishes as well as my own feelings," Herweg says. "We are not selecting students according to their ability to pay but according to their ability to do well in medical school and to make the type of physicians that I think all of us want as graduates of the Washington University School of Medicine."

As soon as applicants are accepted for admission, they may apply for financial aid. Both the student and the parents are required to complete a financial aid application which is sent to the Graduate and Professional School Financial Aid Service (GAPSFAS). "This Service provides us with an analysis of the parent's resources and the

amount of support they have the potential to contribute to the costs of their son's or daughter's medical education expenses," Walters says. "Most professional schools no longer subscribe to students' desire to be financially independent of their parents. We do not see the logic of an individual transferring financial dependency from the parent to the School of Medicine. Students who receive financial aid understand and appreciate this policy understanding the amount of assistance they receive would be reduced significantly if the Committee used School funds to replace the money a family has the potential to contribute."

Walters stresses that the Committee on Student Financial Aid does not always agree with the recommendations of GAPSFAS and



that adjustments are made in consideration of a family's special or unique circumstances.

"In order to continue to fill these ever-growing needs, more endowed scholarship support is needed," Herweg says.

In an endowed scholarship fund the principal is invested and only the interest income is used for scholarship money. Currently, the School of Medicine's annual endowment income is about \$125,000.

"Many of the medical schools with which we compete for the best applicants in the national pool have close to \$1 million in annual endowment income for scholarships," Walters says. "This school is in a consortium with 12 other medical schools, in which we are similar in many ways. These include Stanford, Chicago, Duke, Johns Hopkins, Case Western Reserve, Pennsylvania, Columbia, Cornell, University of Rochester, Harvard, Yale and Pittsburgh.

"When we look at all medical schools, we compare favorably in the amount of scholarship endowment income," Walters says. "But when we look at the prestige schools in this consortium, we do not fare

nearly as well."

"This year Washington University ranked 34th among the 44 private medical schools in tuition charges," Herweg says. "In the 1978-79 school year our tuition will increase from \$4,400 to \$5,600 a year. Tuition at the University of Missouri-Columbia School of Medicine is \$1,230. On the other hand, there are some medical schools where tuition exceeds \$10,000 a year. If we want to continue to compete for the best stu-



## Tuition Increase at WUMS

1920.....	\$200
1930.....	\$400
1940.....	\$500
1950.....	\$764
1960.....	\$1,200
1970.....	\$2,200
1975.....	\$3,100
1977.....	\$4,400
1978.....	\$5,600

dents, we need as much scholarship support as possible."

As costs continue to rise students will be completing medical school with a \$25,000 to \$50,000 debt. Many people are concerned that this potential debt could discourage some very qualified young people from going to medical school. "In addition," Herweg says, "if students graduate with heavy debts, they are more likely to consider going into higher paying specialties. Family practice, as well as academic medicine, will be less attractive."

This not only creates a shortage in important areas of medicine, but can create career unhappiness within the medical profession.

To combat these problems Washington University School of Medicine and medical schools across the country are striving to increase their scholarship funds.

The Alumni Association has recognized the importance of financial aid by supporting two funds.

The Alumni Scholarship Fund is one which has grown, thanks to the Alumni Council and individual alumni.

Started in 1916, the Fund's purpose was to provide one annual prize for high scholastic achievement to a third-year student. By 1970 the fund had grown from \$4,500 to \$9,000 as a result of accumulated interest.

Since that time the Alumni Council has transferred \$35,000 to the Fund. With individual and 25-year reunion class donations,

the principal of the Fund has grown to \$76,962.

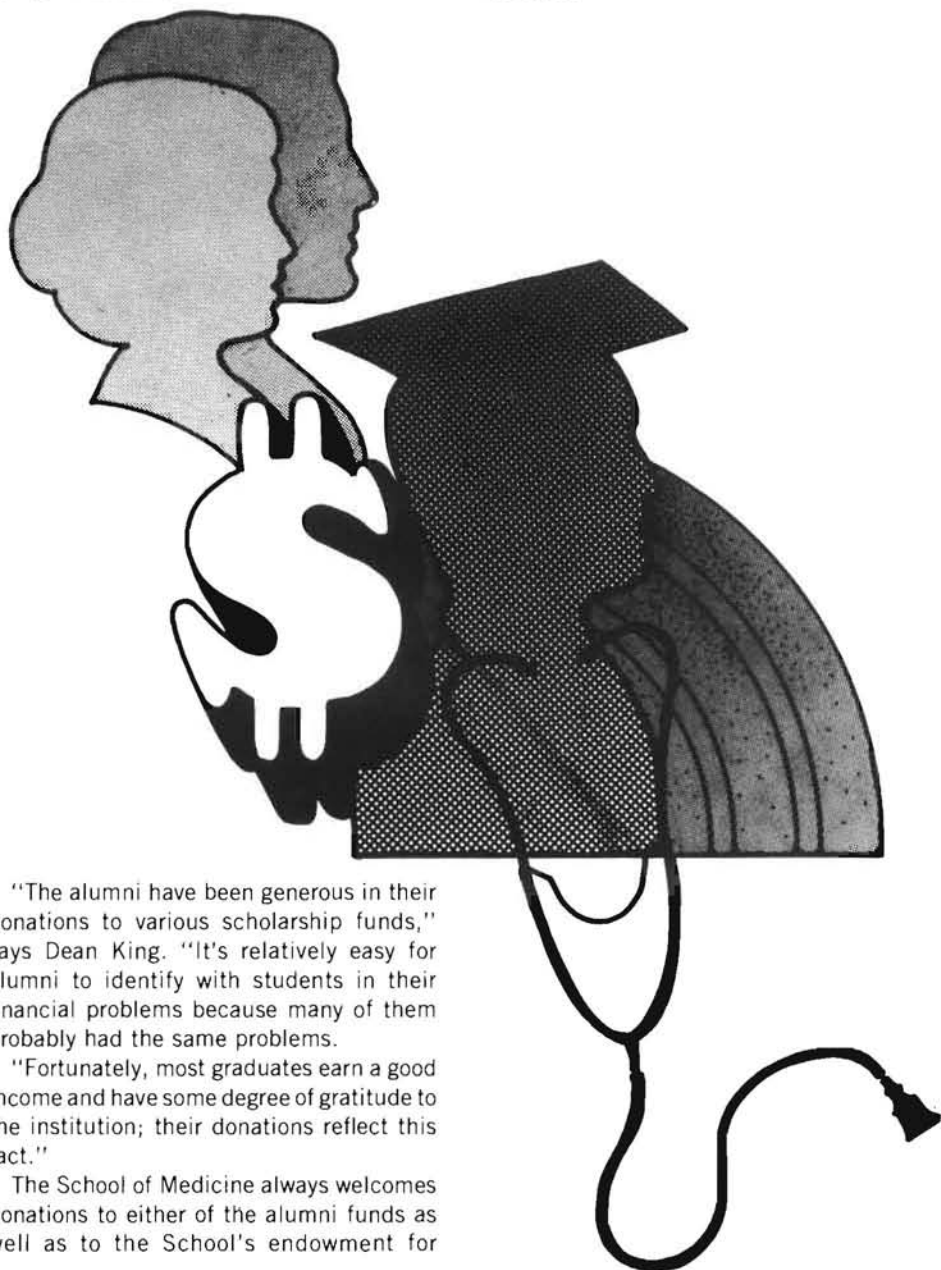
In the 1978-79 school year the Fund will provide a \$200 scholastic prize and another \$4,700 in scholarship money.

"This Fund has grown remarkably," Herweg says, "and we'd certainly like to see it continue to grow."

The Medical Center Alumni Association also supports a revolving Student Loan Fund which provides temporary loans to students, usually in emergency situations. "Often a financial problem can interfere and negatively affect a student's performance," Herweg says. "The Alumni Loan fund has served scores of students."

scholarship and loans. Sixty-six per cent of the donations to the School's scholarship endowment fund are a result of bequests. Alumni comprise 7 per cent of the donations with non-alumni individuals contributing 24 per cent and corporations giving 3 per cent.

For the coming year Walters predicts the School will need more than \$330,000 in scholarship money and \$744,000 in loan money. "With a scholarship endowment income of \$125,000, we're quite a bit short of our needs," he says. "Each year it gets more and more difficult to find the kind of money we need, and without help from alumni and friends of the School, it might well be impossible."



"The alumni have been generous in their donations to various scholarship funds," says Dean King. "It's relatively easy for alumni to identify with students in their financial problems because many of them probably had the same problems."

"Fortunately, most graduates earn a good income and have some degree of gratitude to the institution; their donations reflect this fact."

The School of Medicine always welcomes donations to either of the alumni funds as well as to the School's endowment for



## New test detects prostate cancer

A new test that can detect cancer of the prostate in its earliest stages is being done by urologists at Washington University Medical Center. The test, which is another application of the radioimmunoassay technique for which Dr. Rosalyn Yalow won the 1977 Nobel Prize, is an outgrowth of research sponsored by the National Cancer Institute and the American Cancer Society.

The test has been adapted by W. D. W. Heston, Ph.D., research assistant professor of genitourinary surgery, and Harry Margraf, Ph.D., research assistant professor of surgery, of the urology research laboratories. Testing is being done under the direction of William Fair, M.D., professor of genitourinary surgery and head of the division, and Gerald Sufrin, M.D., associate professor of genitourinary surgery.

Fair estimates that cancer of the prostate will account for 18,000 deaths in 1978. Up until now rectal examination has been the only means available to detect prostatic cancer, and only 5 to 10 per cent of all cases are discovered before the cancer has spread beyond the prostate.

"There is a crying need for some method to detect prostatic cancer at a time when it is still treatable," Fair says. "We feel this test can be one answer."

Sufrin says that up until now none of the common cancers in any area of the body could be detected by a simple blood test. The new method for the detection of prostatic cancer requires only a very small blood sample, which is analyzed by the radioimmunoassay technique to determine the presence of abnormal amounts of an enzyme, acid phosphatase.

"Early results in a limited double-blind study prove that the test can detect prostatic cancer in the earliest stages," Sufrin says. "We now need to test a large group of men at high risk—those above 55—to help determine whether the test should become a routine screening procedure in this age group."

Prostatic cancer is the second greatest cause of cancer deaths in American males,

second only to lung cancer. It is estimated that if the tumors could be detected while they are still small and localized, the cure rate would be dramatically improved. It is hoped that the new radioimmunoassay test will produce results with prostatic cancer as dramatic as the Pap smear has with cervical cancer.

## BCL receives \$5.77 million grant

Washington University's Biomedical Computer Laboratories (BCL), which pioneered in adapting computers to radiation treatment, heart treatment and studies of how drugs act in the body, has been awarded a four-year \$5.77 million grant by the National Institutes of Health.

Biomedical computer personnel at the University developed the first minicomputer used in medical research in the 1960s.

Recently, computers have been used in studying why drugs used in the treatment of schizophrenia often produce serious side effects.

Computer laboratory scientists have also perfected a minicomputer system to analyze cardiac rhythm in patients with heart disease. Patients carry small tape recorders that record heart rhythm for 24 hours. The information is analyzed by the computers and is providing valuable research data.

Such data may some day help physicians anticipate which types of abnormal rhythms are most serious and pinpoint which patients need special rehabilitation programs.

One of the first major computer applications to medicine at the university was their use in the planning of radiation treatment for cancer patients.

Computers were used to speed up time-consuming calculations required in planning how to deliver maximum radiation to cancerous tissue and minimal doses of healthy cells. The computer system developed by the university has been installed at more than 150 radiation centers throughout the world.

The recent NIH grant will support work in five branches of the Computer Laboratories.

A story on the medical uses of computers and advances made by the Biomedical Computer Lab is planned for a future Outlook issue.

## AOA names student members

Twenty students at the School of Medicine have been elected to Alpha Omega Alpha by the faculty and members of their senior class.

AOA is a national honorary society recognizing outstanding scholarship and leadership in medicine and related fields. It is considered the most prestigious honor society in medicine.

St. Louis area students elected to the society are: Thomas R. Kleyman, Lee S. Portnoff and John B. Schweitzer.

Other students elected include: Kim D. Colter, West Brook, CT, Jeffrey E. Doty, West Redding, CT, Mark E. Frisse, Highland, IL, Margaret C. Hochreiter, Rockville Centre, NY, Robert L. Huck, Houston, TX, Joan K. Kreiss, Sooke, B.C., Canada, Timothy J. Ley, Lakota, IA, Thomas Margulies, Cedar Rapids, IA, Dominic M. Meldi, Wilsonville, IL, Ross E. Morgan, Wheat Ridge, CO;

Carlton S. Pearce, Englewood, CA, William A. Renie, Springfield, MO, Mary R. Schwartz, Honolulu, HI, Richard L. Wahl, Waverly, IA, Robert Warren, Athens, GA, Francis X. Witkowski, Long Island City, NY and Stephen G. Young, Topeka, KS.

## Lowry lecture established

The first annual **Oliver H. Lowry Lecture** in Pharmacology was given March 7 at the School of Medicine. Julius Axelrod, Ph.D., chief of the Section of Pharmacology of the National Institute of Mental Health spoke on "Methyl Transferases and Biological Regulation." Axelrod won the Nobel Prize in Medicine and Physiology in 1970.

The Lowry Lecture was established to honor Oliver H. Lowry, M.D., Ph.D., professor of pharmacology. Lowry served as head



of the Department of Pharmacology from 1947-1976 and dean of the School of Medicine from 1955-58. He also is a member of the National Academy of Sciences.

Lowry received the M.D. and Ph.D. degrees simultaneously at the University of Chicago. As a member of numerous national scientific committees he has widely influenced research in medical science, particularly neurology, neurochemistry, mental retardation, and analytical biochemistry. His manuscript on protein measurement is the most frequently cited scientific paper.

## WUMS gets high rating

Washington University has been rated 10th nationally in a study of medical schools.

St. Louis University tied for 53rd place. The University of Missouri was 63rd and the University of Illinois, Chicago, was 38th. Ninety-four schools were surveyed.

The ratings were made by faculty members at 87 schools. The study was financed by the National Science Foundation.

Harvard University, Cambridge, Mass., topped the list. Johns Hopkins University in Baltimore and Stanford University in Stanford, Calif. tied for second place.

Other schools in the top 10 were, the University of California at San Francisco, Yale University, New Haven, Conn., Columbia University, in New York, Duke University, Durham, N.C., Michigan State University, East Lansing and Cornell University, Ithaca, N.Y.

The ratings have been challenged by officials at a number of medical schools that placed low.



Walter F. Ballinger II, M.D.

## Surgery head resigns

**Walter F. Ballinger II, M.D.**, Bixby Professor and Head of the Department of Surgery at Washington University School of Medicine, has resigned his position effective July 1.

Concerning his resignation, Ballinger said, "I feel that I have accomplished all I can in the development of the Department of Surgery and that I should step down in favor of a new chairman. This will provide for me a long needed chance to seek new challenges and opportunities."

Ballinger has served as chairman of the Department of Surgery as well as chief surgeon for Barnes Hospital for more than ten years. "During his leadership the department has increased in numbers of full-time faculty, in research grants and in quality of teaching," said Samuel B. Guze, M.D., vice chancellor for medical affairs.

**William Fair, M.D.**, professor and head of

the Division of Urology, has been named acting head of the Department of Surgery effective July 1.

## 25 students receive awards

Twenty-five students were recently honored at an awards assembly for scholastic excellence in the 1976-77 academic year.

Nancy Doan, Pamela F. Gallin, Joel A. Goebel, Robin L. Heise, Keith L. Parker and Lee S. Portnoff received Lange Medical Publications Books Awards.

The Carl F. and Gerty T. Cori Prize in Biochemistry was received by Jefferson D. Cox, Kevin R. Kowaleski, and Jeffrey B. Kramer.

Jeffrey E. Doty, Robert W. Laakman, and Allen J. Sedman received Dr. Richard S. Brookings Medical School Prizes.

The Dr. Robert Carter Medical School Prizes were awarded to Ronald Gibson, Timothy J. Ley and Mark C. Udey.

Pamela R. Edmonds, Donna A. Kono and Gary A. Press received Cowdry Prizes in Histology.

Daniel Phillips and Michael P. Kappelman received The Dr. James L. O'Leary Neuroscience Prizes. Kappelman also was awarded The Kehar S. Chouke Prize in Anatomy, The George F. Gill Prize in Anatomy and The Antoinette Frances Dames Prize in physiology and biophysics.

Other students honored include: Susan Babcock, The Dr. Margaret G. Smith Award; Kim David Colter, Medical Alumni Scholarship Fund Prize; Goldee H. Gross, The Ciba Award; Cecil J. Holliman, The McCordock Book Prize; and T. Bruce Ferguson, The Louis and Dorothy Kovitz Fellowship in Surgical Research.



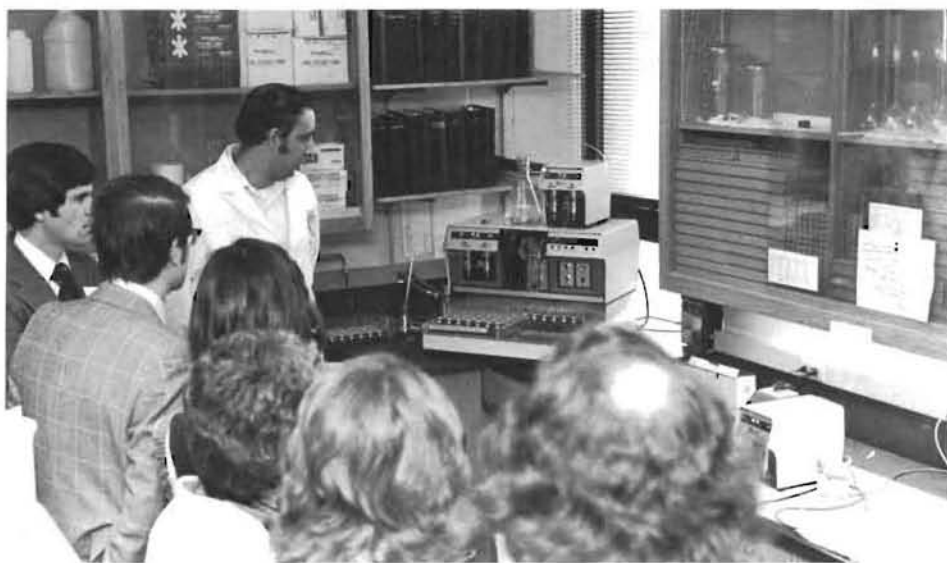
## Diabetes Center Funded

In September 1977, the Washington University School of Medicine was awarded a five-year grant of more than \$4 million by the National Institutes of Health to establish a Diabetes Research and Training Center. The mission of the Center is to conduct basic and clinical research in diabetes and related conditions, to train health professionals and to provide continuing educational programs for practicing professionals with special interests in diabetes.

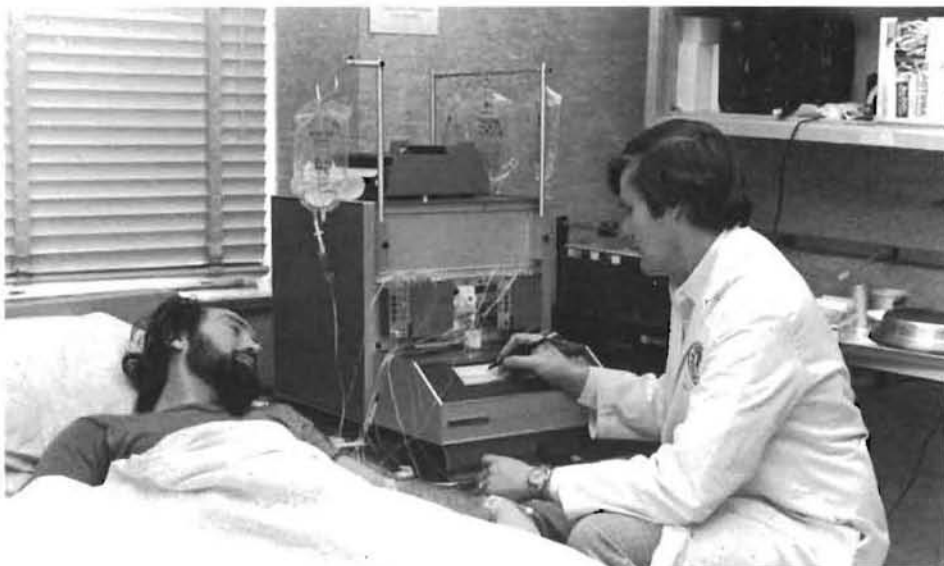
During a recent open house visitors were given tours of various Diabetes Center labs. The summer issue of OUT-LOOK will feature a story on the Center's activities.



*Joseph Williamson, M.D. professor of pathology and head of the Diabetes Center's morphology facility, talks with visitors.*



*Duane Martin, chief technician of the pediatric section of the Center's radio-immunoassay facility, demonstrates an automatic pipetting station.*



*William Clarke, M.D., research fellow, monitors a patient on the artificial pancreas machine.*



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